New Hampshire Building Code Amendments

Effective July 1, 2024

With Errata through September 23, 2024

This courtesy summary of the New Hampshire Building Code amendments is provided for the convenience of the user by the Building Code Review Board and consists of the applicable codes and amendments which have been reviewed and approved by the Board through May 10, 2024, ratified by the General Court per HB1059-2024, effective July 1, 2024 and approved by the Governor on August 2, 2024.

The September 23, 2024 errata corrects typographical errors on BD-21-02-23 R1, ME-21-11-23, PL-21-13-23, RE-21-31-23, and RE-21-32-23 R2.

This document is correct to the best of the Board's knowledge, however, for the legal record of the applicable codes and amendments, refer to the above ratification legislation and the specific amendment exhibits. The Board assumes no liability for errors and/or omissions contained herein.

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Applicable Codes

Per HB1059-2024, RSA 155-A:1, IV, the New Hampshire Building Code means the adoption by reference of the:

International Building Code 2021
International Existing Building Code 2021
International Energy Conservation Code 2018
International Mechanical Code 2021
International Plumbing Code 2021
International Residential Code 2021
International Swimming Pool and Spa Code 2021
NFPA 70 - National Electrical Code 2020
All amendments reviewed and approved by the BCRB as of May 10,2024

Per RSA 155-A:2, 1:

The state building code in effect at the time that the application for the building permit required by RSA 155-A:4 is received by the governing authority shall remain in effect for the duration of the work covered by that permit. This requirement notwithstanding, for a period of 6 months after the effective date of the code adopted under RSA 155-A:1, IV, a concurrency period is established, allowing building permits, and other required documents, at the election of the applicant, to show compliance using either the code in effect just prior the effective date of the code adopted under RSA 155-A:1, IV, or the code adopted under RSA 155-A:1, IV, but not a combination of the 2 codes.

Note: While it is not the intent of this document to reference all statutes that may affect the requirements of this code, Refer to RSA 155:40 for additional plumbing system requirements for food establishments where alcohol is served.

International Building Code® 2021 amendments

Amend Section 101.1 as follows (BD-21-01-23):

101.1Title. These regulations shall be known as the *Building Code* of ~~[NAME OF JURISDICTION]~~*the State of New Hampshire,* hereinafter referred to as "this code."

Add Section 101.2.2 as follows (BD-21-10-23-R1):

101.2 Scope. [No change]
101.2.2 Appendices. The following appendices are hereby adopted: Appendix C Group U–Agricultural Buildings

Amend Section 101.4 as follows (BD-21-02-23-R1):

101.4 Referenced codes. The other codes specified in Sections 101.4.1 through ~~101.4.7~~101.4.11 and referenced elsewhere in this code shall be considered to be part of the requirements of this code to the prescribed extent of each such reference.
101.4.1 Gas. ~~The provisions of the International Fuel Gas Code shall apply to the installation of gas piping from the point of delivery, gas appliances and related accessories as covered in this code. These requirements apply to gas piping systems extending from the point of delivery to the inlet connections of appliances and the installation and operation of residential and commercial gas appliances and related accessories.~~ The International Fuel Gas Code is not adopted by RSA 155-A:1,IV. Fuel gas systems shall comply with the New Hampshire Fire Code, pursuant to RSA 153:1, as amended in Saf-FMO 300. Fuel gas provisions are enforced by the building code official and the fire code official.
101.4.2 Mechanical. The provisions of the *International Mechanical Code* ,as amended, shall apply to the installation, *alterations*, *repairs* and replacement of mechanical systems, including equipment, appliances, fixtures, fittings and appurtenances, including ventilating, heating, cooling, air-conditioning and refrigeration systems, incinerators and other energy-related systems.
101.4.3 Plumbing. The provisions of the International Plumbing Code, as amended, shall apply to the installation, alteration, repair and replacement of plumbing systems, including equipment, appliances, fixtures, fittings and appurtenances, and where connected to a water or sewage system and all aspects of a medical gas system. ~~The provisions of the International Private Sewage Disposal Code shall apply to private sewage disposal systems.~~
101.4.4 Private Sewage Disposal Systems. The International Private Sewage Disposal System Code is not adopted by RSA 155-A:1,IV. The provisions of RSA 485-A shall apply to private sewage disposal systems. These provisions are enforced by the Department of Environmental Services.
~~**101.4.4**~~**101.4.5 Property maintenance.** ~~The provisions of the International Property Maintenance Code shall apply to existing structures and premises; equipment and facilities; light, ventilation, space heating, sanitation, life and fire safety hazards; responsibilities of owners, operators and occupants; and occupancy of existing premises and structures.~~ The International Property Maintenance Code is not adopted by RSA 155-A:1,IV.
~~**101.4.5**~~**101.4.6 Fire prevention.** ~~The provisions of the International Fire Code shall apply to matters affecting or relating to structures, processes and premises from the hazard of fire and explosion arising from the storage, handling or use of structures, materials or devices; from conditions hazardous to life, property or public welfare in the occupancy of structures or premises; and from the construction, extension, repair, alteration or removal of fire suppression, automatic sprinkler systems and alarm systems or fire hazards in the structure or on the premises from occupancy or operation.~~ The International Fire Code is not adopted by RSA 155-A:1,IV. References in this code to the International Fire Code are deemed references to the New Hampshire Fire Code, pursuant to RSA 153:1 as amended in Saf-FMO 300. These provisions are enforced by the building code official and by the fire code official.
~~**101.4.6**~~**101.4.7 Energy.** The provisions of the International Energy Conservation Code, as amended, shall apply to all matters governing the design and construction of buildings for energy efficiency, except that references to the 2006 International Energy Conservation Code are deemed references to the 2006 International Energy Conservation Code, as amended during the period this code was applicable in New Hampshire.
~~**101.4.7**~~**101.4.8 Existing buildings.** The provisions of the International Existing Building Code, as amended, shall apply to matters governing the repair, alteration, change of occupancy, addition to and relocation of existing buildings.

101.4.9 Residential Code. References to the International Residential Code in this code are deemed references to the New Hampshire Building Code, RSA 155-A:1,IV.
101.4.10 NFPA Standards except NFPA 70. References to NFPA standards in this code, except for NFPA 70, shall be deemed references to the edition cited in the New Hampshire Fire Code pursuant to RSA 153:1, as amended in Saf FMO-300. NFPA standards referenced by this code are enforced by the building code official and the fire code official.
101.4.11 NFPA 70. References to NFPA 70, National Electrical Code, in this code are deemed references to the New Hampshire Building Code, RSA 155-A:1,IV.

Amend Section 202 as follows (BD-21-11-23):

[F] **FLAMMABLE GAS**. A material that is a gas at 68°F (20°C) or less at 14.7 pounds per square inch atmosphere (psia) (101 kPa) of pressure [a material that has a *boiling point* of 68°F (20°C) or less at 14.7 psia (101 kPa)], ~~which also meets one of the following~~ subdivided as follows:
~~Is~~ Category 1A.
A gas that is ignitable at 14.7 psia (101 kPa) when in a mixture of 13 percent or less by volume with air. ~~has~~
A gas with a flammable range at 14.7 psia (101 kPa) with air of at least 12 percent, regardless of the lower limit, unless data show compliance with Category 1B.
Category 1B.
A gas that meets the flammability criteria for Category 1A, is not pyrophoric or chemically unstable, and meets one or more of the following:
A lower flammability limit of more than 6 percent by volume in air; or
A fundamental burning velocity of less than 3.9 in/s (10 cm/s).
The limits specified shall be determined at 14.7 psi (101 kPa) of pressure and a temperature of 68°F (20°C) in accordance with ASTM E681. Where not otherwise specified, the term "flammable gas" includes both Category 1A and Category 1B.

Amend Section 202 adding the definition as follows (BD-21-19-23-R2):

RECOVERY HOUSE. A primarily non-transient dwelling or dwelling unit that provides a substance-free living environment that supports individuals in recovery from addiction and living as a single household and as more aptly defined in RSA 153:10-d II. Recovery housing shall not include boarding house, rooming house, halfway house or any other facility requiring a license.

Amend Table 307.1(1), Section 307.4 and Section 307.5 as follows (BD-21-12-23):

TABLE 307.1(1)
MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD [a, j, m, n, p]

[Portions of table not shown remain unchanged.]

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE[b]			USE-CLOSED SYSTEMS[b]			USE-OPEN SYSTEMS[b]	
			Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds (cubic feet)	Liquid gallons (pounds)
Flammable gas	Gaseous									
	1A and 1B (High BV)[r]	H-2	NA	NA	1,000[d, e]	NA	NA	1,000[d,e]	NA	NA
	1B (Low BV)[r]				162,500[d,e]			162,500[d,e]		
	Liquified									
	1A and 1B (High BV)[r]	H-2	NA	(150)[d,e]	NA	NA	(150)[d,e]	NA	NA	NA
	1B (Low BV)[r]			(10,000)[d,e]			(10,000)[d,e]			

a. For use of control areas, see Section 414.2.
b. The aggregate quantity in use and storage shall not exceed the quantity specified for storage.
The quantities of alcoholic beverages in retail and wholesale sales occupancies shall not be limited provided the liquids are packaged in individual containers not exceeding 1.3 gallons. In retail and wholesale sales occupancies, the quantities of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable, shall not be limited, provided that such materials are packaged in individual containers not exceeding 1.3 gallons.
Maximum allowable quantities shall be increased 100 percent in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1. Where Note e also applies, the increase for both notes shall be applied accumulatively.
Maximum allowable quantities shall be increased 100 percent when stored in approved storage cabinets, day boxes, gas cabinets, gas rooms or exhausted enclosures or in listed safety cans in accordance with Section 5003.9.10 of the International Fire Code. Where Note d also applies, the increase for both notes shall be applied accumulatively.
Quantities shall not be limited in a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
Allowed only in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
Containing not more than the maximum allowable quantity per control area of Class IA, IB or IC flammable liquids.
The maximum allowable quantity shall not apply to fuel oil storage complying with Section 605.4.2 of the *International Fire Code*.
Quantities in parentheses indicate quantity units in parentheses at the head of each column.
A maximum quantity of 220 pounds of solid or 22 gallons of liquid Class 3 oxidizers is allowed when such materials are necessary for maintenance purposes, operation or sanitation of equipment when the storage containers and the manner of storage are approved.
Net weight of the pyrotechnic composition of the fireworks. Where the net weight of the pyrotechnic composition of the fireworks is not known, 25 percent of the gross weight of the fireworks, including packaging, shall be used.
For gallons of liquids, divide the amount in pounds by 10 in accordance with Section 5003.1.2 of the *International Fire Code*.
For storage and display quantities in Group M and storage quantities in Group S occupancies complying with Section 414.2.5, see Tables 414.2.5(1) and 414.2.5(2).
Densely packed baled cotton that complies with the packing requirements of ISO 8115 shall not be included in this material class.
The following shall not be included in determining the maximum allowable quantities:
Liquid or gaseous fuel in fuel tanks on vehicles.
Liquid or gaseous fuel in fuel tanks on motorized equipment operated in accordance with the *International Fire Code*.
Gaseous fuels in piping systems and fixed appliances regulated by the *International Fuel Gas Code*.
Liquid fuels in piping systems and fixed appliances regulated by the *International Mechanical Code*.
Alcohol-based hand rubs classified as Class I or II liquids in dispensers that are installed in accordance with Sections 5705.5 and 5705.5.1 of the International Fire Code. The location of the alcohol-based hand rub (ABHR) dispensers shall be provided in the construction
Where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 414.1.3.
"High BV" Category 1B flammable gas has a burning velocity greater than 3.9 in/s (10 cm/s). "Low BV" Category 1B flammable gas has a burning velocity of 3.9 in/s (10 cm/s) or less.

[F] **307.4 High-hazard Group H-**2. Buildings and structures containing materials that pose a deflagration hazard or a hazard from accelerated burning shall be classified as Group H-2. Such materials shall include, but not be limited to, the following:
Class I, II or IIIA *flammable or combustible liquids* that are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 pounds per square inch gauge (103.4 kPa).
Combustible dusts where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 414.1.3.
Cryogenic fluids, flammable.
Category 1A *Flammable gases.*
Category 1B *Flammable gases* having a burning velocity greater than 3.9 inches per second (10 cm/s).
Organic peroxides, Class I.
Oxidizers, Class 3, that are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 pounds per square inch gauge (103 kPa).
Pyrophoric liquids, solids and gases, nondetonable.
Unstable (reactive) materials, Class 3, nondetonable.
Water-reactive materials, Class 3.
[F] **307.5 High-hazard Group H-3**. Buildings and structures containing materials that readily support combustion or that pose a *physical hazard* shall be classified as Group H-3. Such materials shall include, but not be limited to, the following:
Class I, II or IIIA *flammable or combustible liquids* that are used or stored in normally closed containers or systems pressurized at 15 pounds per square inch gauge (103.4 kPa) or less.
Combustible fibers, other than densely packed *baled cotton*, where manufactured, generated or used in such a manner that the concentration and conditions create a fire or *explosion* hazard based on information prepared in accordance with Section 414.1.3.
Consumer *fireworks*, 1.4G (Class C, Common).
Cryogenic fluids, oxidizing.
Category 1B *flammable gases* having a burning velocity of 3.9 inches per second (10 cm/s) or less.
Flammable solids.
Organic peroxides, Class II and III.
Oxidizers, Class 2.
Oxidizers, Class 3, that are used or stored in normally closed containers or systems pressurized at 15 pounds per square inch gauge (103 kPa) or less.
Oxidizing gases.
Unstable (reactive) materials, Class 2.
Water-reactive materials, Class 2.

Amend Section 310.3 as follows (BD-21-20-23):

Residential Group R-2 occupancies containing *sleeping units* or more than two *dwelling units* where the occupants are primarily permanent in nature, including:
Apartment houses
Congregate living facilities (nontransient) with more than 16 occupants
Boarding houses (*nontransient*)
Convents
Dormitories
Fraternities and sororities
Monasteries
Hotels (nontransient)
Live/work units
Motels (nontransient)
Vacation timeshare properties
Recovery Houses

Amend Section 310.4 as follows (BD-21-21-23):

Residential Group R-3 occupancies where the occupants are primarily permanent in nature and not classified as Group R-1, R-2, R-4 or I, including:
Buildings that do not contain more than two *dwelling units*
Care facilities that provide accommodations for five or fewer persons receiving care
Congregate living facilities (nontransient) with 16 or fewer occupants
Boarding houses (nontransient)
Convents
Dormitories
Fraternities and sororities
Monasteries
Congregate living facilities (*transient*) with 10 or fewer occupants
Boarding houses (*transient*)
Lodging houses (*transient*) with five or fewer *guest rooms* and 10 or fewer occupants
Recovery Houses

Amend Section 414 as follows (BD-21-13-23):

[F] 414.2.5 Hazardous materials in Group M display and storage areas and in Group S storage areas. *Hazardous materials* located in Group M and Group S occupancies shall be in accordance with Sections 414.2.5.1 through ~~414.2.5.3~~414.2.5.4.

[F] TABLE 414.2.5(1)
MAXIMUM ALLOWABLE QUANTITY PER INDOOR AND OUTDOOR CONTROL AREA IN GROUP M AND S OCCUPANCIES OF NONFLAMMABLE SOLIDS AND NONFLAMMABLE AND NONCOMBUSTIBLE LIQUIDS [d, e, f]

CONDITION		MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA	
Material [a]	**Class**	**Solids (pounds)**	**Liquids (gallons)**
A. Health-hazard materials—nonflammable and noncombustible solids and liquids			
1. Corrosives [b, c]	Not Applicable	9,750	975
2. Highly toxics	Not Applicable	20[b, c]	2[b, c]
3. Toxics [b, c]	Not Applicable	1,000[k]	100
B. Physical-hazard materials—nonflammable and noncombustible solids and liquids			
1. Oxidizers [b, c]	4	Not Allowed	Not Allowed
	3	1,350[g]	115
	2	2,250[h]	225
	1	18,000[i, j]	1,800[i, j]
2. Unstable (reactives) [b, c]	4	Not Allowed	Not Allowed
	3	550	55
	2	1,150	115
	1	Not Limited	Not Limited

CONDITION		MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA	
Material [a]	**Class**	**Solids (pounds)**	**Liquids (gallons)**
3. Water reactives	3[b, c]	550	55
	2[b, c]	1,150	115
	1	Not Limited	Not Limited

For SI: 1 pound = 0.454 kg, 1 gallon = 3.785 L.
a. Hazard categories are as specified in the International Fire Code.
b. Maximum allowable quantities shall be increased 100 percent in buildings that are sprinklered in accordance with Section 903.3.1.1. Where Note c also applies, the increase for both notes shall be applied accumulatively.
c. Maximum allowable quantities shall be increased 100 percent where stored in approved storage cabinets, in accordance with the International Fire Code. Where Note b also applies, the increase for both notes shall be applied accumulatively.
d .See Table 414.2.2 for design and number of control areas.
e. Allowable quantities for other hazardous material categories shall be in accordance with Section 307.
f. Maximum quantities shall be increased 100 percent in outdoor control areas.
g. Maximum amounts shall be increased to 2,250 pounds where individual packages are in the original sealed containers from the manufacturer or packager and do not exceed 10 pounds each.
h. Maximum amounts shall be increased to 4,500 pounds where individual packages are in the original sealed containers from the manufacturer or packager and do not exceed 10 pounds each.
i. The permitted quantities shall not be limited in a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
j. Quantities are unlimited in an outdoor control area.
k. Maximum allowable quantities of consumer products shall be increased to 10,000 pounds where individual packages are in the original, sealed containers from the manufacturer and the toxic classification is exclusively based on the LC threshold and no other hazardous materials classifications apply.

[F]414.2.5.3Aerosol products, aerosol cooking spray products or plastic aerosol 3 products. The maximum quantity of *aerosol products*, aerosol cooking spray products or plastic aerosol 3 products in Group M occupancy retail display areas, storage areas adjacent to retail display areas and retail storage areas shall be in accordance with the International Fire Code.

TABLE 414.2.5(3)
MAXIMUM ALLOWABLE QUANTITY OF LOW BURNING VELOCITY CATEGORY 1B FLAMMABLE GAS IN GROUP M AND S OCCUPANCIES PER CONTROL AREA [a]

FLAMMABLE GAS CATEGORY	MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA	
	Sprinklered in Accordance with Note b	Nonsprinklered
Category 1B (Low BV)[e]		
Gaseous	390,000 cu. ft.	195,000 cu. ft.
Liquefied	40,000 lbs. [c]	20,000 lbs.

For SI: 1 pound = 0.454 kg, 1 cubic foot = 0.02832 m^3, 1 square foot = 0.093 m^2, 1 inch/second = 2.5641 cm/s.
Control areas shall be separated from each other by not less than a 1-hour fire barrier.
The building shall be equipped throughout with an approved automatic sprinkler system with minimum sprinkler design density of Ordinary Hazard Group 2 in the area where flammable gases are stored or displayed.
Where storage areas exceed 50,000 square feet in area, the maximum allowable quantities area allowed to be increased by 2 percent for each 1,000 square feet of area in excess of 50,000 square feet, up to not more than 100 percent of the table amounts. Separation of control areas is not required. The aggregate amount shall not exceed 80,000 pounds.
"Low BV" Category 1B flammable gas has a burning velocity of 3.9 in/s (10 cm/s) or less.

414.2.5.4 Flammable gas.
The aggregate quantity of Category 1B flammable gas having a burning velocity of 3.9 in/s (10 cm/s) or less stored and displayed within a single *control area* of a Group M occupancy or stored in a single *control area* of a Group S occupancy is allowed to exceed the *maximum allowable quantities per control area* specified in Table 307.1(1) without classifying the building or use as a Group H occupancy, provided the materials are stored and displayed in accordance with the *International Fire Code* and quantities do not exceed the amounts specified in Table 414.2.5(3).

[F] TABLE 414.5.1 EXPLOSION CONTROL REQUIREMENTS [a, h]

MATERIAL	CLASS	EXPLOSION CONTROL METHODS	
		Barricade construction	**Explosion (deflagration) venting or explosion (deflagration) prevention systems [b]**
HAZARD CATEGORY			
Combustible dusts [c]	—	Not Required	Required
Cryogenic flammables	—	Not Required	Required
HAZARD CATEGORY			
Explosives	Division 1.1	Required	Not Required
	Division 1.2	Required	Not Required
	Division 1.3	Not Required	Required
	Division 1.4	Not Required	Required
	Division 1.5	Required	Not Required
	Division 1.6	Required	Not Required -
Flammable gas	Gaseous	Not Required	Required [k] -
	Liquefied	Not Required	Required [k]
Flammable liquid	IA [d]	Not Required	Required
	IB [e]	Not Required	Required
Organic peroxides	U	Required	Not Permitted
	I	Required	Not Permitted
Oxidizer liquids and solids	4	Required	Not Permitted
Pyrophoric gas	—	Not Required	Required
Unstable (reactive)	4	Required	Not Permitted
	3 Detonable	Required	Not Permitted
	3 Nondetonable	Not Required	Required
Water-reactive liquids and solids	3	Not Required	Required
	2g	Not Required	Required
SPECIAL USES			
Acetylene generator rooms	—	Not Required	Required
Electrochemical energy storage system [i]	—	Not Required	Required
Energy storage system [i]	—	Not Required	Required
Grain processing	—	Not Required	Required
Liquefied petroleum gas-distribution facilities	—	Not Required	Required
Where explosion hazards exist [f]	Detonation	Required	Not Permitted
	Deflagration	Not Required	Required

See Section 414.1.3.
See the *International Fire Code*.
Combustible dusts where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 104.8.2 of the *International Fire Code*. See definition of "Combustible dust" in Chapter 2.
Storage or use.
In open use or dispensing.
Rooms containing dispensing and use of hazardous materials where an explosive environment can occur because of the characteristics or nature of the hazardous materials or as a result of the dispensing or use process.
A method of explosion control shall be provided where Class 2 water-reactive materials can form potentially explosive mixtures.
Explosion venting is not required for Group H-5 fabrication areas complying with Section 415.11.1 and the *International Fire Code*.
Where explosion control is required in Section 1207 of the *International Fire Code*.
Not required for Category 1B Flammable Gases having a burning velocity not exceeding 3.9 in/s (10 cm/s).

Add new Section 1011.12.3 as follows (BD-21-03-23):

1011.12.3 Equipment and appliances on roofs or elevated structures. Where *equipment* requiring access or appliances are located on an elevated structure or the roof of a building such that personnel will have to climb higher than 16 feet (4877 mm) above grade to access such equipment or appliances, an interior or exterior means of access shall be provided. Such access shall not require climbing over obstructions greater than 30 inches (762 mm) in height or walking on roofs having a slope greater than 4 units vertical in 12 units horizontal (33-percent slope). Such access shall not require the use of portable ladders. Where access involves climbing over parapet walls, the height shall be measured to the top of the parapet wall.
Exception: This section shall not apply to Group R-3 occupancies.

Amend Section 1031.2 as follows (BD-21-18-23-R1 and BD-21-22-23):

1031.1 General.
Emergency escape and rescue openings shall comply with the requirements of this section.
1031.2 Where required.
In addition to the *means of egress* required by this chapter, *emergency escape and rescue openings* shall be provided in the following occupancies:
1. Group R-2 occupancies located in *stories* with only one *exit* or *access to* only one *exit* as permitted by Tables 1006.3.3(1) and 1006.3.3(2).
2. Group R-3 and R-4 occupancies.
3. Group R-2 and R-3 occupancies complying with Section 1011.2.1, Exception 4 of the *International Existing Building Code* for buildings with non-sprinklered *dwelling units*.
4. Group R-2 occupancies complying with Section 803.2.2, Exception 2 and the Exception to Section 803.2.2.1 of the *International Existing Building Code* for buildings with non-sprinklered *dwelling units*.

[remainder of section unchanged]

Add new Section 1102.2 as follows (BD-21-16-23):

1102.2 Certification. The certifications required by NH RSA 155-A:5, both for *construction documents* and at the completion of construction, shall be submitted to the *building official* prior to the issuance of the certificate of occupancy.

Amend Section 1105.1 as follows (BD-21-04-23-R1):

1105.1 Public entrances. In addition to accessible entrances required by Sections 1105.1.2 through ~~1105.1.8~~1105.10, at least 60 percent of all *public entrances* shall be *accessible*.
Exceptions:
1.An accessible entrance is not required to areas not required to be *accessible*.
2.Loading and *service entrances* that are not the only entrance to a tenant space.

~~1105.1.1 Automatic doors.~~

~~In facilities with the occupancies and building *occupant loads* indicated in Table 1105.1.1, *public entrances* that are required to be *accessible* shall have one door be either a full *power-operated* door or a *low-energy power-operated door*. Where the *public entrance* includes a vestibule, at least one door into and one door out of the vestibule shall meet the requirements of this section.~~

~~TABLE 1105.1.1~~

~~PUBLIC ENTRANCE WITH POWER-OPERATED DOOR [a]~~

~~OCCUPANCY~~	~~BUILDING OCCUPANT LOAD GREATER THAN~~
~~A-1, A-2, A-3, A-4~~	~~300~~
~~B, M, R-1~~	~~500~~

~~a. In mixed-use facilities where the total sum of the building occupant load is greater than those listed, the most restrictive building occupant load shall apply.~~

[Sections 1105.1.2 through 1105.1.8 are unchanged]

1105.1.9 At least one of the required *accessible public entrances* in Groups A, E, I-1. I-2, I-3, R-1 and R-2 shall be equipped with either full power-operated or low energy power-operated automatic doors in compliance with ICC A117.1.

1105.1.10 At least one of the required *accessible public entrances* in Groups B and M greater than or equal to 1,000 net square feet (93 m^2) in size, and the nonresidential portion of live/work units per Section 419 greater than or equal to 1,000 net square feet (93 m^2) shall be equipped with either full power-operated or low energy power-operated automatic doors in compliance with ICC A117.1.

1105.1.10.1 Required *accessible public entrances* in Groups B and M less than 1,000 net square feet (93 m^2) in size and the nonresidential portion of live/work units per Section 419 less than 1,000 net square feet (93 m^2), where automatic doors are not provided, an electric signaling device to alert the owner of a presence at the door shall be provided.

Amend Section 1106 as follows (BD-21-14-23 and BD-21-15-23):

1106.1 General. Parking shall comply with Sections 1106.2 through 1106.~~8~~9. Passenger loading zones shall comply with Section 1106.~~9~~10.

1106.6 Van spaces. For every six or fraction of six accessible parking spaces, at least one shall be a van-accessible parking space.

Exception: In Group U *private garages* that serve Group R-2 and R-3 occupancies, van-accessible spaces shall be permitted to have vehicular routes, entrances, parking spaces and access aisles with a minimum vertical clearance of 7 feet (2134 mm).

1106.6.1. Van-accessible parking spaces shall be 96 inches (2440 mm) minimum in width. The adjacent access aisle shall be 96 inches (2440 mm) minimum in width.

1106.8 Marking. Access aisles shall be marked so as to discourage parking in them and designated by vertical "No Parking" signs located at the front of the access aisle and mounted with the bottom of the sign 60 inches (1525 mm) minimum above the floor of the access aisle.

EXCEPTION: A "No Parking" sign is not required when:

1. The placement of the sign would obstruct the accessible route to the accessible entrance.
2. There is a non-removable physical obstacle preventing the placement of the sign.
3. The placement of a sign would be in front of a window wall.
4. The placement of a sign would otherwise be in conflict with a provision of this Code.

1106.~~8~~9 Parking meters and pay stations.

1106.~~9~~10 Passenger loading zones.

1106.~~9~~10.1 Continuous loading zones.

1106.~~9~~10.2 Medical facilities.

1106.~~9~~10.3 Valet parking.

1106.~~9~~10.4 Mechanical access parking garages.

1106.910.4 Mechanical access parking garages.

Add new Section 1110.2.1.2.1 as follows (BD-21-05-23):

1110.2.1.2.1 Changing station. In assembly occupancies with an occupant load of 1,500 or greater and in mercantile occupancies of 40,000 aggregate square feet (3716 m^2) or greater, a permanently mounted, powered, height adjustable adult changing station that complies with Section 603.5 of ICC A117.1 shall be provided in the family or assisted-use toilet room. Each room shall have signage meeting the requirements of ICC A117.1 indicating the presence of the changing station. Central directories, if provided, shall indicate the location(s) of the changing stations.

Add new Section 1110.2.6 as follows (BD-21-06-23):

1110.2.6 Diaper changing tables. In Groups A, B, E, I-4 child day care, M and R-1 hotels and motels, on each floor level containing a public toilet room, both male and female occupants shall have access to at least one diaper changing table complying with Section 603.5 of ICC A117.1. Each room shall have signage indicating the presence of the diaper changing table. Toilet rooms not providing a diaper changing table shall have signage providing directions to the nearest diaper changing table location. Central directories, if provided, shall indicate the location(s) of the diaper changing tables. Signs shall meet the requirements of ICC A117.1.
Exception: Groups B and M less than 1,000 net square feet (93 m^2) in size.

Amend Section 3103.1.2 as follows (BD-21-09-23-R1):

3103.1.2 Permit required. Temporary structures that cover an area greater than 120 square feet (11.16 m^2), including connecting areas or spaces with a common *means of egress* or entrance that are used or intended to be used for the gathering together of 10 or more persons, shall not be erected, operated or maintained for any purpose without obtaining a *permit* from the *building official*.
3103.1.2.1 Tents that cover an area of 200 square feet (18.6 m^2) or greater, including connecting areas or spaces with a common *means of egress* or entrance that are used or intended to be occupied by people shall not be erected, operated or maintained for any purpose without obtaining a *permit* from the *building official*.

End of *International Building Code*® 2021 amendments

International Existing Building Code® 2021 amendments

Amend Section 101.1 as follows (EX-21-01-23):

101.1 Title. These regulations shall be known as the *Existing Building Code* of ~~[NAME OF JURISDICTION]~~the State of New Hampshire, hereinafter referred to as "this code."

Add new Section 102.4.3 as follows (EX-21-02-23):

102.4.3 Referenced codes. The other codes specified in Sections 101.4.1 through 101.4.11 and referenced elsewhere in this code shall be considered to be part of the requirements of this code to the prescribed extent of each such reference.
102.4.3.1 Building. Reference in this code to the International Building Code are deemed references to the New Hampshire Building Code, RSA 155-A:1,IV.
102.4.3.2 Gas. The International Fuel Gas Code is not adopted by RSA 155-A:1,IV. Fuel gas systems shall comply with the New Hampshire Fire Code, pursuant to RSA 153:1, as amended in Saf-FMO 300. Fuel gas provisions are enforced by the building code official and the fire code official.
102.4.3.3 Mechanical. The provisions of the *International Mechanical Code* ,as amended, shall apply to the installation, *alterations*, *repairs* and replacement of mechanical systems, including equipment, appliances, fixtures, fittings and appurtenances, including ventilating, heating, cooling, air-conditioning and refrigeration systems, incinerators and other energy-related systems.
102.4.3.4 Plumbing. The provisions of the International Plumbing Code, as amended, shall apply to the installation, alteration, repair and replacement of plumbing systems, including equipment, appliances, fixtures, fittings and appurtenances, and where connected to a water or sewage system and all aspects of a medical gas system.
102.4.3.5 Private Sewage Disposal Systems. The International Private Sewage Disposal System Code is not adopted by RSA 155-A:1,IV. The provisions of RSA 485-A shall apply to private sewage disposal systems. These provisions are enforced by the Department of Environmental Services.
102.4.3.6 Property maintenance. The International Property Maintenance Code is not adopted by RSA 155-A:1,IV.
102.4.3.7 Fire prevention. The International Fire Code is not adopted by RSA 155-A:1,IV. References in this code to the International Fire Code are deemed references to the New Hampshire Fire Code, pursuant to RSA 153:1 as amended in Saf-FMO 300. These provisions are enforced by the building code official and by the fire code official.
102.4.3.8 Energy. The provisions of the International Energy Conservation Code, as amended, shall apply to all matters governing the design and construction of buildings for energy efficiency, except that references to the 2006 International Energy Conservation Code are deemed references to the 2006 International Energy Conservation Code, as amended during the period this code was applicable in New Hampshire.
102.4.3.9 Residential Code. References to the International Residential Code in this code are deemed references to the references to the New Hampshire Building Code, RSA 155-A:1,IV.
102.4.3.10 NFPA Standards except NFPA 70. References to NFPA standards in this code, except for NFPA 70, shall be deemed references to the edition cited in the New Hampshire Fire Code pursuant to RSA 153:1, as amended in Saf FMO-300. NFPA standards referenced by this code are enforced by the building code official and the fire code official.
102.4.3.11 NFPA 70. References to NFPA 70, National Electrical Code, in this code are deemed references to the New Hampshire Building Code, RSA 155-A:1,IV.

Amend Section 202 adding the definition as follows (EX-21-03-23):

AGGREGATE AREA: The sum total of the building area of all stories of a building, including basements.

Amend Section 306.7 as follows (EX-21-04-23):

306.7 Alterations. A facility that is altered shall comply with the applicable provisions in Chapter 11 of the International Building Code, ICC A117.1 and the provisions of Sections 306.7.1 through ~~306.7.16~~306.7.18, unless technically infeasible. Where compliance with this section is technically infeasible, the alteration shall provide access to the maximum extent technically feasible.

Add new Sections 306.7.17 and 306.7.18 as follows (EX-21-04-23):

306.7.17 Diaper changing tables. The requirements of this section apply to Level III alterations and changes of occupancy. In Groups A, B, E, I-4 child day care, M and R-1 hotels and motels, on each floor level containing a public toilet room, both male and female occupants shall have access to at least one diaper changing table complying with ICC A117.1. Each room shall have signage indicating the presence of the diaper changing table. Toilet rooms not providing a diaper changing table shall have signage providing directions to the nearest diaper changing table location. Central directories, if provided, shall indicate the location(s) of the diaper changing tables. Signs shall meet the requirements of ICC A117.1.

Exception: Groups B and M less than 1,000 net square feet (93 m^2) in size.

306.7.18 Changing station. The requirements of this section apply to Level III alterations and changes of occupancy. In assembly occupancies with an occupant load of 1,500 or greater and in mercantile occupancies of 40,000 aggregate square feet (3716 m^2) or greater, a permanently mounted, powered, height adjustable adult changing station that complies with Section 603.5 of ICC A117.1 shall be provided in the altered toilet rooms, providing access to both male and female occupants, or family or assisted-use toilet room. Each room shall have signage meeting the requirements of ICC A117.1 indicating the presence of the changing station. Central directories, if provided, shall indicate the location(s) of the changing stations.

Amend Section 803.2.2 as follows (EX-21-07-23):

803.2.2 Groups A, B, E, F-1, H, I-1, I-3, I-4, M, R-1, R-2, R-4, S-1 and S-2. In buildings with occupancies in Groups A, B, E, F-1, H, I-1, I-3, I-4, M, R-1, R-2, R-4, S-1 and S-2, work areas that have exits or corridors shared by more than one tenant or that have exits or corridors serving an occupant load greater than 30 shall be provided with automatic sprinkler protection where both of the following conditions occur:

1. The *work area* is required to be provided with automatic sprinkler protection in accordance with the *International Building Code* as applicable to new construction; and
2. The *work area* exceeds 50 percent of the floor area.

Exceptions:

If the building does not have sufficient municipal water supply for design of a fire sprinkler system available to the floor without installation of a new fire pump, work areas shall be protected by an automatic smoke detection system throughout all occupiable spaces other than sleeping units or individual dwelling units that activates the occupant notification system in accordance with Sections 907.4, 907.5 and 907.6 of the *International Building Code*.

An *automatic sprinkler system* shall not be required in Group R-2 buildings containing not more than four nontransient *dwelling units* where all of the following are met:

2.1 Building is three *stories* or less in height.

2.2 Building does not include *congregate living facilities*.

2.3 Building does not involve an increase in height or area except to provide egress or accessibility.

2.4 Each *dwelling unit* has one of the following:

2.4.1 An *exit* door directly to the exterior at the *level of exit discharge*; or

2.4.2 Direct access to an *exterior exit stairway* serving a maximum of two *dwelling units* on the same *story*; or

2.4.3 Direct access to an *interior exit stairway* serving only that *dwelling unit* and separated from all other portions of the building with 1-hour *fire barriers* and *horizontal assemblies*.

2.5 *Dwelling units* have *emergency escape and rescue openings* in accordance with Section 1031 of the *International Building Code*.

803.2.2.1 Mixed uses. In work areas containing mixed uses, one or more of which requires automatic sprinkler protection in accordance with Section 803.2.2, such protection shall not be required throughout the *work area* provided that the uses requiring such protection are separated from those not requiring protection by fire-resistance-rated construction having a minimum 2-hour rating for Group H and a minimum 1-hour rating for all other occupancy groups.

Exception: Refer to Section 803.2.2 Exception 2.

Amend Section 1011.2.1 as follows (EX-21-06-23):

1011.2.1 Fire sprinkler system.

Where a change in occupancy classification occurs or where there is a *change of occupancy* within a space where there is a different fire protection system threshold requirement in Chapter 9 of the *International Building Code* that requires an automatic fire sprinkler system to be provided based on the new occupancy in accordance with Chapter 9 of the *International Building Code*. The installation of the automatic sprinkler system shall be required when the area of the *change of occupancy* and areas of the building not separated horizontally and vertically from the *change of occupancy* by one of the following:

1 thru 6. No change.

Exceptions:

1 thru 3. No change.

4. An *automatic sprinkler system* shall not be required in buildings containing not more than four nontransient *dwelling units* where all of the following are met:

4.1 Building is three *stories* or less in height.

4.2 Building is undergoing a *change of occupancy* to Group R-2 or R-3.

4.3 Building does not include care facilities or *congregate living facilities*.

4.4 Building does not involve an increase in height or area except to provide egress or accessibility.

4.5 Each *dwelling unit* has one of the following:

4.5.1 An *exit* door directly to the exterior at the *level of exit discharge*; or

4.5.2 Direct access to an *exterior exit stairway* serving a maximum of two *dwelling units* on the same *story*; or

4.5.3 Direct access to an *interior exit stairway* serving only that *dwelling unit* and separated from all other portions of the building with 1-hour *fire barriers* and *horizontal assemblies*.

4.6 *Dwelling units* have *emergency escape and rescue openings* in accordance with Section 1031 of the *International Building Code*.

Amend Section 1011.6.1.1 as follows (EX-21-05-23):

1011.6.1.1 Fire wall alternative.

In other than Groups H, F-1 and S-1, fire barriers and horizontal assemblies constructed in accordance with Sections 707 and 711, respectively, of the *International Building Code* shall be permitted to be used in lieu of fire walls to subdivide the building into separate buildings for the purpose of complying with the area limitations required for the new occupancy where all of the following conditions are met:

The buildings are protected throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 of the *International ~~Fire~~ Building Code*.

The maximum allowable area between fire barriers, horizontal assemblies or any combination thereof shall not exceed the maximum allowable area determined in accordance with Chapter 5 of the *International Building Code* without an increase allowed for an automatic sprinkler system in accordance with Section 506 of the *International Building Code*.

The fire-resistance rating of the fire barriers and horizontal assemblies shall be not less than that specified for fire walls in Table 706.4 of the *International Building Code*.

Exception: Where horizontal assemblies are used to limit the maximum allowable area, the required fire resistance rating of the horizontal assemblies shall be permitted to be reduced by 1 hour provided that the height and number of stories increases allowed for an automatic sprinkler system by Section 504 of the *International Building Code* are not used for the buildings.

End of *International Existing Building Code*® 2021 amendments

International Energy Conservation Code® 2018 amendments

Amend Section C101.1 as follows (EN-18-01-21):

C101.1 Title. These regulations shall be known as the *Energy Conservation Code* of ~~[NAME OF JURISDICTION]~~the State of New Hampshire hereinafter referred to as "this code."

Amend Section C101.5 as follows (EN-18-02-21):

C101.5 Compliance. *Residential buildings* shall meet the provisions of IECC—Residential Provisions. *Commercial buildings* shall meet the provisions of IECC—Commercial Provisions.
Exception: Any structure three stories or less above grade plane in height and less than 4,000 square feet (372 m^2) in gross floor area is permitted to show compliance with the 2018 *International Energy Conservation Code* – Residential Provisions rather than the 2018 *International Energy Conservation Code* – Commercial Provisions which would otherwise be applicable.

Delete Section C406 (EN-18-03-21):

SECTION C406
ADDITIONAL EFFICIENCY PACKAGE OPTIONS
[Delete Section in its entirety]

Delete Section C408 (EN-18-04-21):

SECTION C408
SYSTEM COMMISSIONING
[Delete Section in its entirety]

Amend Section C505.1 (EN-18-07-22)

C505.1 General. Spaces undergoing a change in occupancy that would result in an increase in demand for either fossil fuel or electrical energy shall comply with this code except as permitted by Section C-503. Where the use in a space changes from one use in Table C405.3.2(1) or C405.3.2(2) to another use in Table C405.3.2(1) or C405.3.2(2), the installed lighting wattage shall comply with Section C405.3. Where the space undergoing a change in occupancy or use is in a building with a fenestration area that exceeds the limitations of Section C402.4.1, the space is exempt from Section C402.4.1 provided that there is not an increase in fenestration area.
Exceptions:
1. Where the component performance alternative in Section C402.1.5 is used to comply with this section, the proposed UA shall be not greater than 110 percent of the target UA.
2. Where the total building performance option in Section C407 is used to comply with this section, the annual energy cost of the proposed design shall be not greater than 110 percent of the annual energy cost otherwise permitted by Section C407.3.

Amend Section R101.1 as follows (EN-18-05-21):

R101.1 Title. These regulations shall be known as the *Energy Conservation Code* of ~~[NAME OF JURISDICTION]~~the State of New Hampshire hereinafter referred to as "this code."

Amend Section R101.5 as follows (EN-18-06-21):

R101.5 Compliance. *Residential buildings* shall meet the provisions of IECC—Residential Provisions. *Commercial buildings* shall meet the provisions of IECC—Commercial Provisions. Log structures shall meet the provisions of *ICC-400 2017 Standard on Design and Construction of Log Structures*.
Exception: Any structure three stories or less above grade plane in height and less than 4,000 square feet (372 m^2) in gross floor area is permitted to show compliance with the 2018 *International Energy Conservation Code* – Residential Provisions rather than the 2018 *International Energy Conservation Code* – Commercial Provisions which would otherwise be applicable.

Amend Section R505.1 as follows (EN-18-08-22):

R505.1 General. Spaces undergoing a change in occupancy that would result in an increase in demand for either fossil fuel or electrical energy shall comply with this code except as permitted by Section R-503.
R505.2 General. Any space that is converted to a dwelling unit or portion thereof from another use or occupancy shall comply with this code except as permitted by Section R-503.
Exception: Where the simulated performance option in Section R405 is used to comply with this section, the annual energy cost of the *proposed design* is permitted to be 110 percent of the annual energy cost allowed by Section R405.3.

End of *International Energy Conservation Code*® 2018 amendments

International Mechanical Code® 2021 amendments

Amend Section 101.1 as follows (ME-21-01-23):

101.1 Title. These regulations shall be known as the Mechanical Code of ~~[NAME OF JURISDICTION]~~ the State of New Hampshire, hereinafter referred to as "this code."

Amend Section 102.8 as follows (ME-21-10-23):

102.8 Referenced codes and standards. The codes and standards referenced herein shall be those that are listed in Chapter 15 and such codes and standards shall be considered as part of the requirements of this code to the prescribed extent of each such reference and as further regulated in Sections 102.8.1 ~~and 102.8.2~~through 102.8.10.
Exception: Where enforcement of a code provision would violate the conditions of the listing of the equipment or appliance, the conditions of the listing and the manufacturer's installation instructions shall apply.
102.8.1 Conflicts.
Where conflicts occur between provisions of this code and the referenced standards, the provisions of this code shall apply.
102.8.2 Provisions in referenced codes and standards.
Where the extent of the reference to a referenced code or standard includes subject matter that is within the scope of this code, the provisions of this code, as applicable, shall take precedence over the provisions in the referenced code or standard.
102.8.3 Building. Reference in this code to the International Building Code are deemed references to the New Hampshire Building Code, RSA 155-A:1,IV.
102.8.4 Gas. ~~The provisions of the International Fuel Gas Code shall apply to the installation of gas piping from the point of delivery, gas appliances and related accessories as covered in this code. These requirements apply to gas piping systems extending from the point of delivery to the inlet connections of appliances and the installation and operation of residential and commercial gas appliances and related accessories.~~ The International Fuel Gas Code is not adopted by RSA 155-A:1,IV. Fuel gas systems shall comply with the New Hampshire Fire Code, pursuant to RSA 153:1, as amended in Saf-FMO 300. Fuel gas provisions are enforced by the building code official and the fire code official.
102.8.5 Plumbing. The provisions of the International Plumbing Code, as amended, shall apply to the installation, alteration, repair and replacement of plumbing systems, including equipment, appliances, fixtures, fittings and appurtenances, and where connected to a water or sewage system and all aspects of a medical gas system. ~~The provisions of the International Private Sewage Disposal Code shall apply to private sewage disposal systems.~~
102.8.6 Fire prevention. ~~The provisions of the International Fire Code shall apply to matters affecting or relating to structures, processes and premises from the hazard of fire and explosion arising from the storage, handling or use of structures, materials or devices; from conditions hazardous to life, property or public welfare in the occupancy of structures or premises; and from the construction, extension, repair, alteration or removal of fire suppression, automatic sprinkler systems and alarm systems or fire hazards in the structure or on the premises from occupancy or operation.~~ The International Fire Code is not adopted by RSA 155-A:1,IV. References in this code to the International Fire Code are deemed references to the New Hampshire Fire Code, pursuant to RSA 153:1 as amended in Saf-FMO 300. These provisions are enforced by the building code official and by the fire code official.
102.8.7 Energy. The provisions of the International Energy Conservation Code, as amended, shall apply to all matters governing the design and construction of buildings for energy efficiency.
102.8.8 Residential Code. References to the International Residential Code in this code are deemed references to the New Hampshire Building Code, RSA 155-A:1,IV.
102.8.9 NFPA Standards except NFPA 70. References to NFPA standards in this code, except for NFPA 70, shall be deemed references to the edition cited in the New Hampshire Fire Code pursuant to RSA 153:1, as amended in Saf FMO-300. NFPA standards referenced by this code are enforced by the building code official and the fire code official.
102.8.10 NFPA 70. References to NFPA 70, National Electrical Code, in this code are deemed references to the New Hampshire Building Code, RSA 155-A:1,IV.

Amend Section 109 as follows (ME-21-02-23):

SECTION 109
FEES

109.1 ~~Payment of fees.~~ Fee Schedule. Fees for mechanical work shall be as established by the local jurisdiction.
~~A permit shall not be valid until the fees prescribed by law have been paid. An amendment to a permit shall not be released until the additional fee, if any, has been paid.~~

~~**109.2 Schedule of permit fees.** Where work requires a permit, a fee for each permit shall be paid as required, in accordance with the schedule as established by the applicable governing authority.~~

~~**109.3 Permit valuations.** The applicant for a permit shall provide an estimated permit value at the time of application. Permit valuations shall reflect the total value of work, including materials and labor, for which the permit is being issued, such as mechanical equipment and permanent systems. If, in the opinion of the code official, the valuation is underestimated on the application, the permit shall be denied unless the applicant can show detailed estimates to meet the approval of the code official. Final building permit valuation shall be set by the code official.~~

~~**109.4 Work commencing before permit issuance.** Any person who commences work on a mechanical system before obtaining the necessary permits shall be subject to a fee established by the code official that shall be in addition to the required permit fees.~~

~~**109.5 Related fees.** The payment of the fee for the construction, alteration, removal or demolition for work done in connection to or concurrently with the work authorized by a permit shall not relieve the applicant or holder of the permit from the payment of other fees that are prescribed by law.~~

~~**109.6 Refunds.** The code official is authorized to establish a refund policy.~~

Amend Section 115.4 as follows (ME-21-03-23):

115.4 Violation penalties. Persons who shall violate a provision of this code or shall fail to comply with any of the requirements thereof or who shall erect, install, alter or repair mechanical work in violation of the approved construction documents or directive of the code official, or of a permit or certificate issued under the provisions of this code, shall be ~~guilty of a [SPECIFY OFFENSE], punishable by a fine of not more than [AMOUNT] dollars or by imprisonment not exceeding [NUMBER OF DAYS], or both such fine and imprisonment~~subject to penalties as prescribed by law. Each day that a violation continues after due notice has been served shall be deemed a separate offense.

Amend Section 116.4 as follows (ME-21-04-23):

116.4 Failure to comply. Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be subject to ~~fines established by the authority having jurisdiction~~penalties as prescribed by law.

Amend Section 606.2.4 by adding the definitions as follows (ME-21-09-23):

BIOMASS. As defined in New Hampshire Administrative Rules Env-A 1401.03(d).

BIOMASS FUEL. For use in this section, biomass fuels are defined as "solid" organic matter, not including woods derived from construction or demolition debris; wood that has been chemically treated; or agricultural crops or aquatic plants or byproducts from such crops or plants which have been used to rehabilitate a contaminated or brownfields site through a process known as "phytoremediation".

Add New Section 301.19 as follows (ME-21-06-23):

301.19 HVAC Systems Testing & Balancing. HVAC systems shall be balanced in accordance with generally accepted engineering standards. Air and water flow rates shall be measured and adjusted to deliver final flow rates within the tolerances provided in the product specifications. Test and balance activities shall include air system and hydronic system balancing.

301.19.1 Air systems balancing. Each supply air outlet and *zone* terminal device shall be equipped with means for air balancing in accordance with the requirements of Chapter 6 of the *International Mechanical Code.* Discharge

dampers used for air-system balancing are prohibited on constant volume fans and variable-volume fans with motors 10hp (18.6kW) and larger. Air systems shall be balanced in a manner to first minimize throttling losses then, for fans with system power of greater than 1hp (0.746 kW), fan speed shall be adjusted to meet design flow conditions.

Exception: Fans with fan motors of 1hp (0.746 kW) or less are not required to be provided with a means for air balancing.

3**01.19.2 Hydronic systems balancing**. Individual hydronic heating and cooling coils shall be equipped with means for balancing and measuring flow. Hydronic systems shall be proportionately balanced in a manner to first minimize throttling losses, then the pump impeller shall be trimmed, or pump speed shall be adjusted to meet design flow conditions. Each hydronic system shall have either the capability to measure pressure across pump, or test ports at each side of each pump.

Exceptions: The following equipment is not required to be equipped with a means for balancing or measuring flow:

1. Pumps with pump motors 5 hp (3.7 kW) or less.
2. Where throttling results in no greater than 5 percent of the nameplate horsepower draw above that required if the impeller were trimmed.

301.19.3 System balancing report. A written report describing the activities and measurement completed in accordance with generally accepted engineering standards and Testing & Balancing industry standards.

Add New Section 606.2.4 as follows (ME-21-07-23):

606.2.4 Additional smoke detectors. Smoke detectors shall be installed downstream of the air filters and ahead of any branch connections in air supply systems with a design capacity of greater than 2000 cfm (0.9 m3/s).

Exception: Smoke detectors are not required in the return air system where all portions of the building served by the air distribution system are protected by area smoke detectors connected to a fire alarm system in accordance with the International Building Code. The area smoke detection system shall comply with Section 606.4.

Add New Section 1004.1.1 as follows (ME-21-08-23):

1004.1.1 Solid Fuel-Burning Boilers. Solid Fuel-Burning Boilers listed and conforming to European Committee for Standardization 2022 EN 303-5, "Heating Boilers – Part 5: Heating Boilers for Solid-Fuels, Manually and Automatically Stoked, Nominal Heat Output of Up to 300 Kw – Terminology, Requirements, Testing and Marking "shall be permitted for biomass fuels when all data plates; warning labels; limits on temperature and pressure of relief valves; installation, operations, and maintenance manuals; all operating and safety gauges and controls; and construction and emissions specification documents are provided in English using U.S. customary system units of measurement. All pipe connections shall meet the North American ASTM standards for pipe and fittings.

Delete Chapter 11 and insert as follows (ME-21-11-23):
[Changes from the 2018 NH Building Code and from the 2021 IMC are not shown]
[This amendment is copied from 2024 IMC Chapter 11, copyright by the ICC]

CHAPTER11
REFRIGERATION

SECTION1101
GENERAL

1101.1Scope.

This chapter shall govern the design, installation, construction and repair of refrigeration systems that vaporize and liquefy a fluid during the refrigerating cycle. Permanently installed refrigerant storage systems and other components shall be considered as part of the refrigeration system to which they are attached.

1101.1.1 Refrigerants other than ammonia.

Refrigerant piping design and installation for systems containing a refrigerant other than ammonia, including pressure vessels and pressure relief devices, shall comply with this chapter and ASHRAE 15.

1101.1.2 Ammonia refrigerant.

Refrigeration systems using ammonia as the refrigerant shall comply with IIAR 2, IIAR 3, IIAR 4 and IIAR 5 and shall not be required to comply with this chapter.

1101.2 Factory-built equipment and appliances.

Listed and *labeled* self-contained, factory-built *equipment* and *appliances* shall be tested in accordance with the applicable standards specified in Table 1101.2. Such *equipment* and *appliances* are deemed to meet the design, manufacture and factory test requirements of this code if installed in accordance with their listing and the manufacturer's instructions.

TABLE 1101.2
FACTORY-BUILT EQUIPMENT AND APPLIANCES

EQUIPMENT	STANDARDS
Refrigeration fittings, including press-connect, flared and threaded	UL 109 and UL 207
Air-conditioning equipment	UL 1995 or UL/CSA 60335-2-40
Packaged terminal air conditioners and heat pumps	UL 484 or UL/CSA 60335-2-40
Split-system air conditioners and heat pumps	UL 1995 or UL/CSA 60335-2-40
Dehumidifiers	UL 474 or UL/CSA 60335-2-40
Unit coolers	UL 412 or UL/CSA 60335-2-89
Commercial refrigerators, freezers, beverage coolers and walk-in coolers	UL 471 or UL/CSA 60335-2-89
Refrigerating units and walk-in coolers	UL 427 or UL 60335-2-89
Refrigerant-containing components and accessories	UL 207

1101.3 Protection.
Any portion of a refrigeration system that is subject to physical damage shall be protected in an *approved* manner.

1101.4 Water connection.
Water supply and discharge connections associated with refrigeration systems shall be made in accordance with this code and the *International Plumbing Code*.

1101.5 Fuel gas connection.
Fuel gas devices, *equipment* and *appliances* used with refrigeration systems shall be installed in accordance with the *International Fuel Gas Code*.

1101.6 Maintenance.

Mechanical refrigeration systems shall be maintained in proper operating condition, free from accumulations of oil, dirt, waste, excessive corrosion, other debris and leaks.

1101.7 Change in refrigerant type.

The type of refrigerant in refrigeration systems having a refrigerant circuit containing more than 220 pounds (99.8 kg) of Group A1 or 30 pounds (13.6 kg) of any other group refrigerant shall not be changed without prior notification to the code official and compliance with the applicable code provisions for the new refrigerant type.

[F]1101.8 Refrigerant discharge.
Notification of refrigerant discharge shall be provided in accordance with the *International Fire Code*.

1101.9 Locking access port caps.
Refrigerant circuit access ports located outdoors shall be fitted with locking-type tamper-resistant caps or shall be otherwise secured to prevent unauthorized access.

Exception: This section shall not apply to refrigerant circuit access ports on *equipment* installed in controlled areas such as on roofs with locked access hatches or doors.

SECTION1102
SYSTEM REQUIREMENTS

1102.1 General.

The system classification, allowable refrigerants, maximum quantity, enclosure requirements, location limitations, and field pressure test requirements shall be determined as follows:

1. Determine the refrigeration system's classification, in accordance with Section 1103.3.
2. Determine the refrigerant classification in accordance with Section 1103.1.
3. Determine the maximum allowable quantity of refrigerant in accordance with Section 1104, based on type of refrigerant, system classification and *occupancy*.
4. Determine the system enclosure requirements in accordance with Section 1104.
5. Refrigeration *equipment* and *appliance* location and installation shall be subject to the limitations of Chapter 3.
6. Nonfactory-tested, field-erected *equipment* and *appliances* shall be pressure tested in accordance with Section 1108.

1102.2 Refrigerants.

The refrigerant shall be that which the *equipment* or *appliance* was designed to utilize or converted to utilize. Refrigerants not identified in Table 1103.1 shall be *approved* before use.

1102.2.1 Mixing.

Refrigerants, including refrigerant blends, with different designations in ASHRAE 34 shall not be mixed in a system.

Exception: Addition of a second refrigerant is allowed where permitted by the *equipment* or *appliance* manufacturer to improve oil return at low temperatures. The refrigerant and amount added shall be in accordance with the manufacturer's instructions.

1102.2.2 Purity.

Refrigerants used in refrigeration systems shall be new, recovered or *reclaimed refrigerants* in accordance with Section 1102.2.2.1, 1102.2.2.2 or 1102.2.2.3. Where required by the *equipment* or *appliance* owner or the code official, the installer shall furnish a signed declaration that the refrigerant used meets the requirements of Section 1102.2.2.1, 1102.2.2.2 or 1102.2.2.3.

Exception: The refrigerant used shall meet the purity specifications set by the manufacturer of the *equipment* or *appliance* in which such refrigerant is used where such specifications are different from that specified in Sections 1102.2.2.1, 1102.2.2.2 and 1102.2.2.3.

1102.2.2.1 New refrigerants.

Refrigerants shall be of a purity level specified by the *equipment* or *appliance* manufacturer.

1102.2.2.2 Recovered refrigerants.

Refrigerants that are recovered from refrigeration and air-conditioning systems shall not be reused in other than the system from which they were recovered and in other systems of the same owner. *Recovered refrigerants* shall be filtered and dried before reuse. *Recovered refrigerants* that show clear signs of contamination shall not be reused unless reclaimed in accordance with Section 1102.2.2.3.

1102.2.2.3 Reclaimed refrigerants.
Used refrigerants shall not be reused in a different owner's *equipment* or *appliances* unless tested and found to meet the purity requirements of AHRI 700. Contaminated refrigerants shall not be used unless reclaimed and found to meet the purity requirements of AHRI 700.

1102.3 Access port protection.
Refrigerant access ports shall be protected in accordance with Section 1101.9 whenever refrigerant is added to or recovered from refrigeration or air-conditioning systems.

SECTION1103
REFRIGERATION SYSTEM CLASSIFICATION

1103.1 Refrigerant classification.

Refrigerants shall be classified in accordance with ASHRAE 34 as listed in Table 1103.1.

TABLE 1103.1
REFRIGERANT CLASSIFICATION, AMOUNT AND OEL

CHEMICAL REFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT CLASSIFICATION	AMOUNT OF REFRIGERANT PER OCCUPIED SPACE				[F] DEGREES OF HAZARD[a]
				Pounds per 1,000 cubic feet	ppm	g/m^3	OEL[e]	
R-11[d]	CCl_3F	trichlorofluoromethane	A1	0.39	1,100	6.2	C1,000	2-0-0[b]
R-12[d]	CCl_2F_2	dichlorodifluoromethane	A1	5.6	18,000	90	1,000	2-0-0[b]
R-13[d]	$CClF_3$	chlorotrifluoromethane	A1	—	—	—	1,000	2-0-0[b]
R-13B1[d]	$CBrF_3$	bromotrifluoromethane	A1	—	—	—	1,000	2-0-0[b]
R-14	CF_4	tetrafluoromethane (carbon tetrafluoride)	A1	25	110,000	400	1,000	2-0-0[b]
R-22	$CHClF_2$	chlorodifluoromethane	A1	13	59,000	210	1,000	2-0-0[b]
R-23	CHF_3	trifluoromethane (fluoroform)	A1	7.3	41,000	120	1,000	2-0-0[b]
R-30	CH_2Cl_2	dichloromethane (methylene chloride)	B1	—	—	—	—	—
R-32	CH_2F_2	difluoromethane (methylene fluoride)	A2[c]	4.8	36,000	77	1,000	1-4-0
R-40	CH_3Cl	chloromethane (methyl chloride)	B2	—	—	—	—	—
R-50	CH_4	methane	A3	—	—	—	1,000	—

CHEMICAL REFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT CLASSIFICATION	AMOUNT OF REFRIGERANT PER OCCUPIED SPACE				[F] DEGREES OF HAZARD[a]
				Pounds per 1,000 cubic feet	ppm	g/m^3	OEL[e]	
R-113[d]	CCl_2FCClF_2	1,1,2-trichloro-1,2,2-trifluoroethane	A1	1.2	2,600	20	1,000	2-0-0[b]
R-114[d]	$CClF_2CClF_2$	1,2-dichloro-1,1,2,2-tetrafluoroethane	A1	8.7	20,000	140	1,000	2-0-0[b]
R-115	$CClF_2CF_3$	chloropentafluoroethane	A1	47	120,000	760	1,000	—
R-116	CF_3CF_3	hexafluoroethane	A1	34	97,000	550	1,000	1-0-0
R-123	$CHCl_2CF_3$	2,2-dichloro-1,1,1-trifluoroethane	B1	3.5	9,100	57	50	2-0-0[b]
R-124	$CHClFCF_3$	2-chloro-1,1,1,2-tetrafluoroethane	A1	3.5	10,000	56	1,000	2-0-0[b]
R-125	CHF_2CF_3	pentafluoroethane	A1	23	75,000	370	1,000	2-0-0[b]
R-134a	CH_2FCF_3	1,1,1,2-tetrafluoroethane	A1	13	50,000	210	1,000	2-0-0[b]
R-141b	CH_3CCl_2F	1,1-dichloro-1-fluoroethane	—	0.78	2,600	12	500	2-1-0
R-142b	CH_3CClF_2	1-chloro-1, 1-difluoroethane	A2	5.1	20,000	83	1,000	2-4-0
R-143a	CH_3CF_3	1,1,1-trifluoroethane	A2[c]	4.5	21,000	70	1,000	2-0-0[b]
R-152a	CH_3CHF_2	1,1-difluoroethane	A2	2.0	12,000	32	1,000	1-4-0

CHEMICAL REFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT CLASSIFICATION	AMOUNT OF REFRIGERANT PER OCCUPIED SPACE				[F] DEGREES OF HAZARD[a]
				Pounds per 1,000 cubic feet	ppm	g/m^3	OEL[e]	
R-170	CH_3CH_3	ethane	A3	0.54	7,000	8.7	1,000	2-4-0
R-E170	CH_3OCH_3	Methoxymethane (dimethyl ether)	A3	1.0	8,500	16	1,000	—
R-218	$CF_3CF_2CF_3$	octafluoropropane	A1	43	90,000	690	1,000	2-0-0[b]
R-227ea	CF_3CHFCF_3	1,1,1,2,3,3,3-heptafluoropropane	A1	36	84,000	580	1,000	—
R-236fa	$CF_3CH_2CF_3$	1,1,1,3,3,3-hexafluoropropane	A1	21	55,000	340	1,000	2-0-0[b]
R-245fa	$CHF_2CH_2CF_3$	1,1,1,3,3-pentafluoropropane	B1	12	34,000	190	300	2-0-0[b]
R-290	$CH_3CH_2CH_3$	propane	A3	0.56	5,300	9.5	1,000	2-4-0
R-C318	$-(CF_2)_4-$	octafluorocyclobutane	A1	41	80,000	660	1,000	—
R-400[d]	zeotrope	R-12/114 (50.0/50.0)	A1	10	28,000	160	1,000	2-0-0[b]
R-400[d]	zeotrope	R-12/114 (60.0/40.0)	A1	11	30,000	170	1,000	—
R-401A	zeotrope	R-22/152a/124 (53.0/13.0/34.0)	A1	6.6	27,000	110	1,000	2-0-0[b]

CHEMICAL REFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT CLASSIFICATION	AMOUNT OF REFRIGERANT PER OCCUPIED SPACE				[F] DEGREES OF HAZARD[a]
				Pounds per 1,000 cubic feet	ppm	g/m^3	OEL[e]	
R-401B	zeotrope	R-22/152a/124 (61.0/11.0/28.0)	A1	7.2	30,000	120	1,000	2-0-0[b]
R-401C	zeotrope	R-22/152a/124 (33.0/15.0/52.0)	A1	5.2	20,000	84	1,000	2-0-0[b]
R-402A	zeotrope	R-125/290/22 (60.0/2.0/38.0)	A1	17	66,000	270	1,000	2-0-0[b]
R-402B	zeotrope	R-125/290/22 (38.0/2.0/60.0)	A1	15	63,000	240	1,000	2-0-0[b]
R-403A	zeotrope	R-290/22/218 (5.0/75.0/20.0)	A2	7.6	33,000	120	1,000	2-0-0[b]
R-403B	zeotrope	R-290/22/218 (5.0/56.0/39.0)	A1	18	70,000	290	1,000	2-0-0[b]
R-404A	zeotrope	R-125/143a/134a (44.0/52.0/4.0)	A1	31	130,000	500	1,000	2-0-0[b]
R-405A	zeotrope	R-22/152a/142b/C318 (45.0/7.0/5.5/42.5)	—	16	57,000	260	1,000	—
R-406A	zeotrope	R-22/600a/142b (55.0/4.0/41.0)	A2	4.7	21,000	25	1,000	—
R-407A	zeotrope	R-32/125/134a (20.0/40.0/40.0)	A1	19	83,000	300	1,000	2-0-0[b]
R-407B	zeotrope	R-32/125/134a (10.0/70.0/20.0)	A1	21	79,000	330	1,000	2-0-0[b]

CHEMICAL REFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT CLASSIFICATION	AMOUNT OF REFRIGERANT PER OCCUPIED SPACE				[F] DEGREES OF HAZARD[a]
				Pounds per 1,000 cubic feet	ppm	g/m^3	OEL[e]	
R-407C	zeotrope	R-32/125/134a (23.0/25.0/52.0)	A1	18	81,000	290	1,000	2-0-0[b]
R-407D	zeotrope	R-32/125/134a (15.0/15.0/70.0)	A1	16	68,000	250	1,000	2-0-0[b]
R-407E	zeotrope	R-32/125/134a (25.0/15.0/60.0)	A1	17	80,000	280	1,000	2-0-0[b]
R-407F	zeotrope	R-32/125/134a (30.0/30.0/40.0)	A1	20	95,000	320	1,000	—
R-407G	zeotrope	R-32/125/134a (2.5/2.5/95.0)	A1	13	52,000	210	1,000	—
R-407H	zeotrope	R-32/125/134a (32.5/15.0/52.5)	A1	19	92,000	300	1,000	—
R-408A	zeotrope	R-125/143a/22 (7.0/46.0/47.0)	A1	21	95,000	340	1,000	2-0-0[b]
R-409A	zeotrope	R-22/124/142b (60.0/25.0/15.0)	A1	7.1	29,000	110	1,000	2-0-0[b]
R-409B	zeotrope	R-22/124/142b (65.0/25.0/10.0)	A1	7.3	30,000	120	1,000	2-0-0[b]
R-410A	zeotrope	R-32/125 (50.0/50.0)	A1	26	140,000	420	1,000	2-0-0[b]
R-410B	zeotrope	R-32/125 (45.0/55.0)	A1	27	140,000	430	1,000	2-0-0[b]
R-411A	zeotrope	R-127/22/152a (1.5/87.5/11.0)	A2	2.9	14,000	46	990	—

CHEMICAL REFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT CLASSIFICATION	AMOUNT OF REFRIGERANT PER OCCUPIED SPACE				[F] DEGREES OF HAZARD[a]
				Pounds per 1,000 cubic feet	ppm	g/m^3	OEL[e]	
R-411B	zeotrope	R-1270/22/152a (3.0/94.0/3.0)	A2	2.8	13,000	45	980	—
R-412A	zeotrope	R-22/218/142b (70.0/5.0/25.0)	A2	5.1	22,000	82	1,000	—
R-413A	zeotrope	R-218/134a/600a (9.0/88.0/3.0)	A2	5.8	22,000	94	1,000	—
R-414A	zeotrope	R-22/124/600a/142b (51.0/28.5/4.0/16.5)	A1	6.4	26,000	100	1,000	—
R-414B	zeotrope	R-22/124/600a/142b (50.0/39.0/1.5/9.5)	A1	6.0	23,000	95	1,000	—
R-415A	zeotrope	R-22/152a (82.0/18.0)	A2	2.9	14,000	47	1,000	—
R-415B	zeotrope	R-22/152a (25.0/75.0)	A2	2.1	12,000	34	1,000	—
R-416A	zeotrope	R-134a/124/600 (59.0/39.5/1.5)	A1	3.9	14,000	62	1,000	2-0-0[b]
R-417A	zeotrope	R-125/134a/600 (46.6/50.0/3.4)	A1	3.5	13,000	56	1,000	2-0-0[b]
R-417B	zeotrope	R-125/134a/600 (79.0/18.3/2.7)	A1	4.3	15,000	70	1,000	—
R-417C	zeotrope	R-125/134a/600 (19.5/78.8/1.7)	A1	5.4	21,000	87	1,000	—

CHEMICAL REFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT CLASSIFICATION	AMOUNT OF REFRIGERANT PER OCCUPIED SPACE				[F] DEGREES OF HAZARD[a]
				Pounds per 1,000 cubic feet	ppm	g/m^3	OEL[e]	
R-418A	zeotrope	R-290/22/152a (1.5/96.0/2.5)	A2	4.8	22,000	77	1,000	—
R-419A	zeotrope	R-125/134a/E170 (77.0/19.0/4.0)	A2	4.2	15,000	67	1,000	—
R-419B	zeotrope	R-125/134a/E170 (48.5/48.0/3.5)	A2	4.6	17,000	74	1,000	—
R-420A	zeotrope	R-134a/142b (88.0/12.0)	A1	12	45,000	190	1,000	2-0-0[b]
R-421A	zeotrope	R-125/134a (58.0/42.0)	A1	17	61,000	280	1,000	2-0-0[b]
R-421B	zeotrope	R-125/134a (85.0/15.0)	A1	21	69,000	330	1,000	2-0-0[b]
R-422A	zeotrope	R-125/134a/600a (85.1/11.5/3.4)	A1	18	63,000	290	1,000	2-0-0[b]
R-422B	zeotrope	R-125/134a/600a (55.0/42.0/3.0)	A1	16	56,000	250	1,000	2-0-0[b]
R-422C	zeotrope	R-125/134a/600a (82.0/15.0/3.0)	A1	18	62,000	290	1,000	2-0-0[b]
R-422D	zeotrope	R-125/134a/600a (65.1/31.5/3.4)	A1	16	58,000	260	1,000	2-0-0[b]
R-422E	zeotrope	R-125/134a/600a (58.0/39.3/2.7)	A1	16	57,000	260	1,000	—
R-423A	zeotrope	R-134a/227ea (52.5/47.5)	A1	19	59,000	310	1,000	2-0-0[b]

CHEMICAL REFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT CLASSIFICATION	AMOUNT OF REFRIGERANT PER OCCUPIED SPACE				[F] DEGREES OF HAZARD[a]
				Pounds per 1,000 cubic feet	ppm	g/m^3	OEL[e]	
R-424A	zeotrope	R-125/134a/600a/600/601a (50.5/47.0/0.9/1.0/0.6)	A1	6.2	23,000	100	970	2-0-0[b]
R-425A	zoetrope	R-32/134a/227ea (18.5/69.5/12.0)	A1	16	72,000	260	1,000	2-0-0[b]
R-426A	zeotrope	R-125/134a/600a/601a (5.1/93.0/1.3/0.6)	A1	5.2	20,000	83	990	—
R-427A	zeotrope	R-32/125/143a/134a (15.0/25.0/10.0/50.0)	A1	18	79,000	290	1,000	2-1-0
R-428A	zeotrope	R-125/143a/290/600a (77.5/20.0/0.6/1.9)	A1	23	83,000	370	1,000	—
R-429A	zeotrope	R-E170/152a/600a (60.0/10.0/30.0)	A3	0.81	6,300	13	1,000	—
R-430A	zeotrope	R-152a/600a (76.0/24.0)	A3	1.3	8,000	21	1,000	—
R-431A	zeotrope	R-290/152a (71.0/29.0)	A3	0.69	5,500	11	1,000	—
R-432A	zeotrope	R-1270/E170 (80.0/20.0)	A3	0.13	1,200	2.1	700	—
R-433A	zeotrope	R-1270/290 (30.0/70.0)	A3	0.34	3,100	5.5	880	—
R-433B	zeotrope	R-1270/290 (5.0-95.0)	A3	0.51	4,500	8.1	950	—

CHEMICAL REFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT CLASSIFICATION	AMOUNT OF REFRIGERANT PER OCCUPIED SPACE				[F] DEGREES OF HAZARD[a]
				Pounds per 1,000 cubic feet	ppm	g/m^3	OEL[e]	
R-433C	zeotrope	R-1270/290 (25.0-75.0)	A3	0.41	3,600	6.6	790	—
R-434A	zeotrope	R-125/143a/600a (63.2/18.0/16.0/2.8)	A1	20	73,000	320	1,000	—
R-435A	zeotrope	R-E170/152a (80.0/20.0)	A3	1.1	8,500	17	1,000	—
R-436A	zeotrope	R-290/600a (56.0/44.0)	A3	0.50	4,000	8.1	1,000	—
R-436B	zeotrope	R-290/600a (52.0/48.0)	A3	0.51	4,000	8.1	1,000	—
R-437A	zeotrope	R-125/134a/600/601 (19.5/78.5/1.4/0.6)	A1	5.0	19,000	82	990	—
R-438A	zeotrope	R-32/125/134a/600/601a (8.5/45.0/44.2/1.7/0.6)	A1	4.9	20,000	79	990	—
R-439A	zeotrope	R-32/125/600a (50.0/47.0/3.0)	A2	4.7	26,000	76	990	—
R-440A	zeotrope	R-290/134a/152a (0.6/1.6/97.8)	A2	1.9	12,000	31	1,000	—
R-441A	zeotrope	R-170/290/600a/600 (3.1/54.8/6.0/36.1)	A3	0.39	3,200	6.3	1,000	—
R-442A	zeotrope	R-32/125/134a/152a/227ea (31.0/31.0/30.0/3.0/5.0)	A1	21	100,000	330	1,000	—

CHEMICAL REFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT CLASSIFICATION	AMOUNT OF REFRIGERANT PER OCCUPIED SPACE				[F] DEGREES OF HAZARD[a]
				Pounds per 1,000 cubic feet	ppm	g/m^3	OEL[e]	
R-443A	zeotrope	R-1270/290/600a (55.0/40.0/5.0)	A3	0.19	1,700	3.1	580	—
R-444A	zeotrope	R-32/152a/1234ze(E) (12.0/5.0/83.0)	A2[c]	5.1	21,000	81	850	—
R-444B	zeotrope	R-32/152a/1234ze(E) (41.5/10.0/48.5)	A2[c]	4.3	23,000	69	890	—
R-445A	zeotrope	R-744/134a/1234ze(E) (6.0/9.0/85.0)	A2[c]	4.2	16,000	67	930	—
R-446A	zeotrope	R-32/1234ze(E)/600 (68.0/29.0/3.0)	A2[c]	2.5	16,000	39	960	—
R-447A	zeotrope	R-32/125/1234ze(E) (68.0/3.5/28.5)	A2[c]	2.6	16,000	42	900	—
R-447B	zeotrope	R-32/125/1234ze(E) (68.0/8.0/24.0)	A2[c]	23	30,000	360	970	—
R-448A	zeotrope	R-32/125/1234yf/134a/1234ze (E)(26.0/26.0/20.0/21.0/7.0)	A1	24	110,000	390	890	—
R-449A	zeotrope	R-32/125/1234yf/134a (24.3/24.7/25.3/25.7)	A1	23	100,000	370	830	—
R-449B	zeotrope	R-32/125/1234yf/134a (25.2/24.3/23.2/27.3)	A1	23	100,000	370	850	—
R-449C	zeotrope	R-32/125/1234yf/134a (20.0/20.0/31.0/29.0)	A1	23	98,000	360	800	—
R-450A	zeotrope	R-134a/1234ze(E) (42.0/58.0)	A1	20	72,000	320	880	—
R-451A	zeotrope	R-1234yf/134a (89.8/10.2)	A2[c]	5.3	18,000	81	520	—
R-451B	zeotrope	R-1234yf/134a (88.8/11.2)	A2[c]	5.3	18,000	81	530	—
R-452A	zeotrope	R-32/125/1234yf (11.0/59.0/30.0)	A1	27	10,000	440	780	—
R-452B	zeotrope	R-32/125/1234yf (67.0/7.0/26.0)	A2[c]	23	30,000	360	870	—
R-452C	zeotrope	R-32/125/1234yf (12.5/61.0/26.5)	A1	27	100,000	430	800	—
R-453A	zeotrope	R-32/125/134a/227ea/600/601a(20.0/20.0/53.8/5.0/0.6/0.6)	A1	7.8	34,000	120	1,000	—

CHEMICAL REFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT CLASSIFICATION	AMOUNT OF REFRIGERANT PER OCCUPIED SPACE				[F] DEGREES OF HAZARD[a]
				Pounds per 1,000 cubic feet	ppm	g/m^3	OEL[e]	
R-454A	zeotrope	R-32/1234yf (35.0/65.0)	A2[c]	28	16,000	450	690	—
R-454B	zeotrope	R-32/1234yf (68.9/31.1)	A2[c]	22	19,000	360	850	—
R-454C	zeotrope	R-32/1234yf (21.5/78.5)	A2[c]	29	19,000	460	620	—
R-455A	zeotrope	R-744/32/1234yf (3.0/21.5/75.5)	A2[c]	23	30,000	380	650	—
R-456A	zeotrope	R-32/134a/1234ze(E) (6.0/45.0/49.0)	A1	20	77,000	320	900	—
R-457A	zeotrope	R-32/1234yf/152a (18.0/70.0/12.0)	A2[c]	25	15,000	400	650	—
R-458A	zeotrope	R-32/125/134a/227ea/236fa (20.5/4.0/61.4/13.5/0.6)	A1	18	76,000	280	1,000	—
R-459A	zeotrope	R-32/1234yf/1234ze(E) (68.0/26.0/6.0)	A2[c]	23	27,000	360	870	—
R-459B	zeotrope	R-32/1234yf/1234ze(E) (21.0/69.0/10.0)	A2[c]	30	16,000	470	640	—
R-460A	zeotrope	R-32/125/134a/1234ze(E) (12.0/52.0/14.0/22.0)	A1	24	92,000	380	650	—
R-460B	zeotrope	R-32/125/134a/1234ze(E) (28.0/25.0/20.0/27.0)	A1	25	120,000	400	950	—
R-461A	zeotrope	R-125/143a/134a/227ea/600a (55.0/5.0/32.0/5.0/3.0)	A1	17	61,000	270	1,000	—
R-462A	zeotrope	R-32/125/143a/134a/600 (9.0/42.0/2.0/44.0/3.0)	A2	3.9	16,000	62	1,000	—
R-463A	zeotrope	R-744/32/125/1234yf/134a (6.0/36.0/30.0/14.0/14.0)	A1	19	98,000	300	990	—
R-500[e]	azeotrope	R-12/152a (73.8/26.2)	A1	7.6	30,000	120	1,000	2-0-0[b]
R-501[d]	azeotrope	R-22/12 (75.0/25.0)	A1	13	54,000	210	1,000	—
R-502[e]	azeotrope	R-22/115 (48.8/51.2)	A1	21	73,000	330	1,000	2-0-0[b]
R-503[e]	azeotrope	R-23/13 (40.1/59.9)	—	—	—	—	1,000	2-0-0[b]

CHEMICAL REFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT CLASSIFICATION	AMOUNT OF REFRIGERANT PER OCCUPIED SPACE				[F] DEGREES OF HAZARD[a]
				Pounds per 1,000 cubic feet	ppm	g/m^3	OEL[e]	
R-504[d]	azeotrope	R-32/115 (48.2/51.8)	—	28	140,000	450	1,000	—
R-507A	azeotrope	R-125/143a (50.0/50.0)	A1	32	130,000	520	1,000	2-0-0[b]
R-508A	azeotrope	R-23/116 (39.0/61.0)	A1	14	55,000	220	1,000	2-0-0[b]
R-508B	azeotrope	R-23/116 (46.0/54.0)	A1	13	52,000	200	1,000	2-0-0[b]
R-509A	azeotrope	R-22/218 (44.0/56.0)	A1	24	75,000	390	1,000	2-0-0[b]
R-510A	azeotrope	R-E170/600a (88.0/12.0)	A3	0.87	7,300	14	1,000	—
R-511A	azeotrope	R-290/E170 (95.0/5.0)	A3	0.59	5,300	9.5	1,000	—
R-512A	azeotrope	R-134a/152a (5.0/95.0)	A2	1.9	11,000	31	1,000	—
R-513A	azeotrope	R-1234yf/134a (56.0/44.0)	A1	20	72,000	320	650	—
R-513B	azeotrope	R-1234yf/134a (58.5/41.5)	A1	21	74,000	330	640	—
R-514A	azeotrope	R-1336mzz(S)/1130(E) (74.7/25.3)	B1	0.86	2,400	14	320	—
R-515A	azeotrope	R-1234ze(E)/227ea (88.0/12.0)	A1	19	62,000	300	810	—
R-516A	azeotrope	R-1234yf/134a/152a (77.5/8.5/14.0)	A2	7.0	27,000	110	590	—
R-600	$CH_3CH_2CH_2CH_3$	butane	A3	0.15	1,000	2.4	1,000	1-4-0

CHEMICAL REFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT CLASSIFICATION	AMOUNT OF REFRIGERANT PER OCCUPIED SPACE				[F] DEGREES OF HAZARD[a]
				Pounds per 1,000 cubic feet	ppm	g/m^3	OEL[e]	
R-600a	$CH(CH_3)_2CH_3$	2-methylpropane (isobutane)	A3	0.59	4,000	9.6	1,000	2-4-0
R-601	$CH_3CH_2CH_2CH_2CH_3$	pentane	A3	0.18	1,000	2.9	600	—
R-601a	$(CH_3)_2CHCH_2CH_3$	2-methylbutane (isopentane)	A3	0.18	1,000	2.9	600	—
R-610	$CH_3CH_2OCH_2CH_3$	ethoxyethane (ethyl ether)	—	—	—	—	400	—
R-611	$HCOOCH_3$	methyl formate	B2	—	—	—	100	—
R-718	H_2O	water	A1	—	—	—	—	0-0-0
R-744	CO_2	carbon dioxide	A1	4.5	40,000	72	5,000	2-0-0[b]
R-1130(E)	CHCl=CHCl	trans-1,2-dichloroethene	B1	0.25	1,000	4	200	—
R-1132a	$CF_2=CH_2$	1,1-difluoroethylene	A2	2.0	13,000	33	500	—
R-1150	$CH_2=CH_2$	ethene (ethylene)	A3	—	—	—	200	1-4-2
R-1224yd(Z)	$CF_3CF=CHCl$	(Z)-1-chloro-2,3,3,3-tetrafluoroethylene	A1	23	60,000	360	1,000	—
R-1233zd(E)	$CF_3CH=CHCl$	trans-1-chloro-3,3,3-trifluoro-1-propene	A1	5.3	16,000	85	800	—
R-1234yf	$CF_3CF=CH_2$	2,3,3,3-tetrafluoro-1-propene	A2[c]	4.7	16,000	75	500	—

CHEMICAL REFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT CLASSIFICATION	AMOUNT OF REFRIGERANT PER OCCUPIED SPACE				[F] DEGREES OF HAZARD[a]
				Pounds per 1,000 cubic feet	ppm	g/m^3	OEL[e]	
R-1234ze(E)	$CF_3CH=CHF$	trans-1,3,3,3-tetrafluoro-1 -propene	A2[c]	4.7	16,000	75	800	—
R-1270	$CH_3CH=CH_2$	Propene (propylene)	A3	0.1	1,000	1.7	500	1-4-1
R-1336mzz(Z)	$CF_3CHCHCF_3$	cis-1,1,1,4,4,4-hexaflouro-2-butene	A1	5.4	13,000	87	500	—

For SI: 1 pound = 0.454 kg, 1 cubic foot = 0.0283m^3.

a. Degrees of hazard are for health, fire, and reactivity, respectively, in accordance with NFPA 704.

b. Reduction to 1-0-0 is allowed if analysis satisfactory to the code official shows that the maximum concentration for a rupture or full loss of refrigerant charge would not exceed the IDLH, considering both the refrigerant quantity and room volume.

c. The ASHRAE Standard 34 flammability classification for this refrigerant is 2L, which is a subclass of Class 2.

~~c.~~d. Class I ozone depleting substance; prohibited for new installations.

~~d.~~e. Occupational Exposure Limit based on the OSHA PEL, ACGIH TLV-TWA, the TERA WEEL or consistent value on a time-weighed average (TWA) basis (unless noted C for ceiling) for an 8 hr/d and 40 hr/wk.

1103.2 Occupancy classification.

Locations of refrigerating systems are described by *occupancy* classifications that consider the ability of people to respond to potential exposure to refrigerants. Where *equipment* or *appliances*, other than piping, are located outside a building and within 20 feet (6096 mm) of any building opening, such *equipment* or *appliances* shall be governed by the *occupancy* classification of the building. *Occupancy* classifications shall be defined as follows:

1. Institutional *occupancy* is that portion of premises from which occupants cannot readily leave without the assistance of others because they are disabled, debilitated or confined. Institutional *occupancies* include, among others, hospitals, nursing homes, asylums and spaces containing locked cells.

2. Public assembly *occupancy* is that portion of premises where large numbers of people congregate and from which occupants cannot quickly vacate the space. Public assembly *occupancies* include, among others, auditoriums, ballrooms, classrooms, passenger depots, restaurants and theaters.

3. Residential *occupancy* is that portion of premises that provides the occupants with complete independent living facilities, including permanent provisions for living, sleeping, eating, cooking and sanitation. Residential *occupancies* include, among others, dormitories, hotels, multiunit apartments and private residences.

4. Commercial *occupancy* is that portion of premises where people transact business, receive personal service or purchase food and other goods. Commercial *occupancies* include, among others, office and professional buildings, markets (but not large mercantile occupancies) and work or storage areas that do not qualify as industrial *occupancies*.

5. Large mercantile *occupancy* is that portion of premises where more than 100 persons congregate on levels above or below street level to purchase personal merchandise.

6. Industrial *occupancy* is that portion of premises that is not open to the public, where access by authorized persons is controlled, and that is used to manufacture, process or store goods such as chemicals, food, ice, meat or petroleum.

7. Mixed *occupancy* occurs where two or more *occupancies* are located within the same building. Where each *occupancy* is isolated from the rest of the building by tight walls, floors and ceilings and by self-closing doors, the requirements for each *occupancy* shall apply to its portion of the building. Where the various *occupancies* are not so isolated, the *occupancy* having the most stringent requirements shall be the governing *occupancy*.

1103.3 System classification.

Refrigeration systems shall be classified according to the degree of probability that refrigerant leaked from a failed connection, seal or component could enter an occupied area. The distinction is based on the basic design or location of the components.

1103.3. 1Low-probability systems.

Double-indirect open-spray systems, indirect closed systems and indirect-vented closed systems shall be classified as low-probability systems, provided that all refrigerant-containing piping and fittings are isolated where the quantities in Table 1103.1 are exceeded.

1103.3.2 High-probability systems.

Direct systems and indirect open-spray systems shall be classified as high-probability systems.

Exception: An indirect open-spray system shall not be required to be classified as a high-probability system if the pressure of the secondary coolant is at all times (operating and standby) greater than the pressure of the refrigerant.

SECTION1104
SYSTEM APPLICATION REQUIREMENTS

1104.1 General.

The refrigerant, occupancy and system classification cited in this section shall be determined in accordance with Sections 1103.1, 1103.2 and 1103.3, respectively.

1104.2 Machinery room.

Except as provided in Sections 1104.2.1 and 1104.2.2, all components containing the refrigerant shall be located either outdoors or in a *machinery room* where the quantity of refrigerant in an independent circuit of a system exceeds the amounts shown in Table 1103.1. For refrigerant blends not listed in Table 1103.1, the same requirement shall apply where the amount for any blend component exceeds that indicated in Table 1103.1 for that component. This requirement shall also apply where the combined amount of the blend components exceeds a limit of 69,100 parts per million (ppm) by volume. *Machinery rooms* required by this section shall be constructed and maintained in accordance with Section 1105 for Group A1 and B1 refrigerants and in accordance with Sections 1105 and 1106 for Group A2, B2, A3 and B3 refrigerants.

Exceptions:

1. *Machinery rooms* are not required for *listed equipment* and *appliances* containing not more than 6.6 pounds (3 kg) of refrigerant, regardless of the refrigerant's safety classification, where installed in accordance with the *equipment's* or *appliance's* listing and the *equipment* or *appliance* manufacturer's installation instructions.
2. Piping in compliance with Section 1107 is allowed in other locations to connect components installed in a *machinery room* with those installed outdoors.

1104.2.1 Institutional occupancies.

The amounts shown in Table 1103.1 shall be reduced by 50 percent for all areas of institutional *occupancies* except kitchens, laboratories and mortuaries. The total of all Group A2, B2, A3 and B3 refrigerants shall not exceed 550 pounds (250 kg) in occupied areas or *machinery rooms*.

1104.2. 2 Industrial occupancies and refrigerated rooms.

This section applies only to rooms and spaces that: are within industrial *occupancies*; contain a refrigerant evaporator; are maintained at temperatures below 68°F (20°C); and are used for manufacturing, food and beverage

preparation, meat cutting, other processes and storage. Where a *machinery room* would otherwise be required by Section 1104.2, a *machinery room* shall not be required where all of the following conditions are met:

1. The space containing the machinery is separated from other *occupancies* by tight construction with tight-fitting doors.
2. Access is restricted to authorized personnel.
3. Refrigerant detectors are installed as required for *machinery rooms* in accordance with Section 1105.3.

   Exception: Refrigerant detectors are not required in unoccupied areas that contain only continuous piping that does not include valves, valve assemblies, *equipment* or *equipment* connections.

4. Surfaces having temperatures exceeding 800°F (427°C) and open flames are not present where any Group A2, B2, A3 or B3 refrigerant is used (see Section 1104.3.4).
5. All electrical *equipment* and *appliances* conform to Class I, Division 2, *hazardous location* classification requirements of NFPA 70 where the quantity of any Group A2, B2, A3 or B3 refrigerant in a single independent circuit would exceed 25 percent of the lower flammability limit (LFL) upon release to the space.
6. All refrigerant-containing parts in systems with a total connected compressor power exceeding 100 horsepower (hp) (74.6 kW)—except evaporators used for refrigeration or dehumidification, condensers used for heating, control and pressure relief valves for either, low-probability pumps and connecting piping—are located either outdoors or in a *machinery room*.

1104.3 Refrigerant restrictions.

Refrigerant applications, maximum quantities and use shall be restricted in accordance with Sections 1104.3.1 through 1104.3.4.

1104.3.1 Air conditioning for human comfort.

In other than industrial *occupancies* where the quantity in a single independent circuit does not exceed the amount in Table 1103.1, Group B1, B2 and B3 refrigerants shall not be used in high-probability systems for air conditioning for human comfort.

1104.3.2 Nonindustrial occupancies.

Group A2 and B2 refrigerants shall not be used in high-probability systems where the quantity of refrigerant in any independent refrigerant circuit exceeds the amount shown in Table 1104.3.2. Group A3 and B3 refrigerants shall not be used except where *approved*.

Exception: This section does not apply to laboratories where the floor area per occupant is not less than 100 square feet (9.3 m^2).

TABLE 1104.3.2
MAXIMUM PERMISSIBLE QUANTITIES OF REFRIGERANTS

TYPE OF REFRIGERATION SYSTEM	MAXIMUM POUNDS FOR VARIOUS OCCUPANCIES			
	Institutional	Public assembly	Residential	All other occupancies
Sealed absorption system				
In exit access	0	0	3.3	3.3
In adjacent outdoor locations	0	0	22	22
In other than exit access	0	6.6	6.6	6.6
Unit systems				
In other than exit access	0	0	6.6	6.6

For SI: 1 pound = 0.454 kg.

1104.3.3 All occupancies.

The total of all Group A2, B2, A3 and B3 refrigerants shall not exceed 1,100 pounds (499 kg) except where *approved*.

1104.3.4 Protection from refrigerant decomposition.

Where any device having an open flame or surface temperature greater than 800°F (427°C) is used in a room containing more than 6.6 pounds (3 kg) of refrigerant in a single independent circuit, a hood and exhaust system shall be provided in accordance with Section 510. Such exhaust system shall exhaust *combustion* products to the outdoors.

Exception: A hood and exhaust system shall not be required where any of the following apply:

1. The refrigerant is R-718 (water) or R-744 (carbon dioxide).
2. The *combustion* air is ducted from the outdoors in a manner that prevents leaked refrigerant from being combusted.
3. A refrigerant detector is used to stop the *combustion* in the event of a refrigerant leak (see Sections 1105.3 and 1105.5).

1104.4 Volume calculations.

Volume calculations shall be in accordance with Sections 1104.4.1 through 1104.4.3.

1104.4.1 Noncommunicating spaces.

Where the refrigerant-containing parts of a system are located in one or more spaces that do not communicate through permanent openings or HVAC ducts, the volume of the smallest, enclosed occupied space shall be used to determine the permissible quantity of refrigerant in the system.

1104.4.2 Communicating spaces.

Where an evaporator or condenser is located in an air duct system, the volume of the smallest, enclosed occupied space served by the duct system shall be used to determine the maximum allowable quantity of refrigerant in the system.

Exception: If airflow to any enclosed space cannot be reduced below one-quarter of its maximum, the entire space served by the air duct system shall be used to determine the maximum allowable quantity of refrigerant in the system.

1104.4.3 Plenums.

Where the space above a suspended ceiling is continuous and part of the supply or return air *plenum* system, this space shall be included in calculating the volume of the enclosed space.

SECTION1105
MACHINERY ROOM, GENERAL REQUIREMENTS

P

[BF]1105.1 Design and construction.
Machinery rooms shall be designed and constructed in accordance with the *International Building Code* and this section.

1105.2 Openings.
Ducts and air handlers in the *machinery room* that operate at a lower pressure than the room shall be sealed to prevent any refrigerant leakage from entering the airstream.

[F]1105.3 Refrigerant detector.
Refrigerant detectors in *machinery rooms* shall be provided as required by Sections 608.9 and 608.18 of the *International Fire Code*.

1105.4 Tests.
Periodic tests of the mechanical ventilating system shall be performed in accordance with manufacturer's specifications and as required by the code official.

1105.5 Fuel-burning appliances.
Fuel-burning *appliances* and *equipment* having open flames and that use *combustion* air from the *machinery room* shall not be installed in a *machinery room*.

Exceptions:

1. Where the refrigerant is water (R-718) or carbon dioxide (R-744).
2. Fuel-burning *appliances* shall not be prohibited in the same *machinery room* with refrigerant-containing *equipment* or *appliances* where *combustion* air is ducted from outside the *machinery room* and sealed in such a manner as to prevent any refrigerant leakage from entering the *combustion* chamber, or where a refrigerant vapor detector is employed to automatically shut off the *combustion* process in the event of refrigerant leakage.

1105.6 Ventilation.
Machinery rooms shall be mechanically ventilated to the outdoors.
Exception: Where a refrigerating system is located outdoors more than 20 feet (6096 mm) from any building opening and is enclosed by a penthouse, lean-to or other open structure, natural or mechanical ventilation shall be provided. Location of the openings shall be based on the relative density of the refrigerant to air. The free-aperture cross section for the ventilation of the *machinery room* shall be not less than:

$$F = \sqrt{G}$$

(Equation 11-1)

For SI: $F = 0.138\sqrt{G}$

where:

F = The free opening area in square feet (m^2).
G = The mass of refrigerant in pounds (kg) in the largest system, any part of which is located in the *machinery room*.

1105.6.1 Discharge location.
The discharge of the air shall be to the outdoors in accordance with Chapter 5. Exhaust from mechanical ventilation systems shall be discharged not less than 20 feet (6096 mm) from a property line or openings into buildings.

1105.6.1.1 Indoor exhaust opening location.
Indoor mechanical exhaust intake openings shall be located where refrigerant leakage is likely to concentrate based on the refrigerant's relative density to air, and the locations of the air current paths and refrigerating machinery.

1105.6.2 Makeup air.
Provisions shall be made for *makeup air* to replace that being exhausted. Openings for *makeup air* shall be located to avoid intake of *exhaust air*. Supply and exhaust ducts to the *machinery room* shall not serve any other area, shall be constructed in accordance with Chapter 5 and shall be covered with corrosion-resistant screen of not less than 1/4-inch (6.4 mm) mesh.

1105.6.3 Ventilation rate.

Mechanical ventilation systems shall be capable of exhausting the minimum quantity of air both at normal operating and emergency conditions, as required by Sections 1105.6.3.1 and 1105.6.3.2. Multiple fans or

multispeed fans shall be allowed to produce the emergency ventilation rate and to obtain a reduced airflow for normal ventilation.

1105.6.3.1 Quantity—normal ventilation.
During occupied conditions, the mechanical ventilation system shall exhaust the larger of the following:

1. Not less than 0.5 cfm per square foot (0.0025 $m^3/s \cdot m^2$) of *machinery room* area or 20 cfm (0.009 m^3/s) per person.
2. A volume required to limit the room temperature rise to 18°F (10°C) taking into account the ambient heating effect of all machinery in the room.

1105.6.3.2 Quantity—emergency conditions.
Upon actuation of the refrigerant detector required in Section 1105.3, the mechanical ventilation system shall *exhaust air* from the *machinery room* in the following quantity:

$$Q = 100 \times \sqrt{G}$$

(Equation 11-2)

For SI: $Q = 0.07 \times \sqrt{G}$

where:

Q = The airflow in cubic feet per minute (m^3/s).
G = The design mass of refrigerant in pounds (kg) in the largest system, any part of which is located in the *machinery room*.

1105.7 Termination of relief devices.

Pressure relief devices, fusible plugs and purge systems located within the *machinery room* shall terminate outside of the structure at a location not less than 15 feet (4572 mm) above the adjoining grade level and not less than 20 feet (6096 mm) from any window, ventilation opening or exit.

[F]1105.8Emergency pressure control system.

Emergency pressure control systems shall be provided in accordance with Section 608.11 of the *International Fire Code*.

[BE]1105.9 Means of egress.

Machinery rooms larger than 1,000 square feet (93 m^2) shall have not less than two exits or exit access doorways. Where two exit access doorways are required, one such doorway is permitted to be served by a fixed ladder or an alternating tread device. Exit access doorways shall be separated by a horizontal distance equal to one-half the maximum horizontal dimension of the room. All portions of *machinery rooms* shall be within 150 feet (45 720 mm) of an exit or exit access doorway. An increase in exit access travel distance is permitted in accordance with Section 1017.1 of the *International Building Code*. Exit and exit access doorways shall swing in the direction of egress travel and shall be equipped with panic hardware, regardless of the occupant load served. Exit and exit access doorways shall be tight fitting and self-closing.

SECTION1106
MACHINERY ROOM, SPECIAL REQUIREMENTS

1106.1 General.

Where required by Section 1104.2, the *machinery room* shall meet the requirements of this section in addition to the requirements of Section 1105.

1106.2 Elevated temperature.

There shall not be an open flame-producing device or continuously operating hot surface over 800°F (427°C) permanently installed in the room.

1106.3 Flammable refrigerants.

Where refrigerants of Groups A2, A3, B2 and B3 are used, the *machinery room* shall conform to the Class I, Division 2, *hazardous location* classification requirements of NFPA 70.
Exception: *Machinery rooms* for systems containing Group A2L *refrigerants* that are provided with ventilation in accordance with Section 1106.4.

1106.4 Special requirements for Group A2L refrigerant machinery rooms.

Machinery rooms with systems containing Group A2L *refrigerants* that do not conform to the Class I, Division 2, hazardous location electrical requirements of NFPA 70, as permitted by the exception to Section 1106.3, shall comply with Sections 1106.4.1 through 1106.4.3.

Exception: *Machinery rooms* conforming to the Class I, Division 2, hazardous location classification requirements of NFPA 70 are not required to comply with Sections 1106.4.1 and 1106.4.2.

[F]1106.4.1 Ventilation system activation.

Ventilation shall be activated by the refrigerant detection system in the *machinery room*. Refrigerant detection systems shall be in accordance with Section 608.9 of the *International Fire Code* and all of the following:

1. The detectors shall activate at or below a refrigerant concentration of 25 percent of the LFL.
2. Upon activation, the detection system shall activate the emergency ventilation system required by Section 1106.4.2.
3. The detection, signaling and control circuits shall be supervised.

1106.4.2 Emergency ventilation system.

An emergency ventilation system shall be provided at the minimum exhaust rate specified in ASHRAE 15 or Table 1106.4.2. Shutdown of the emergency ventilation system shall be by manual means.

TABLE 1106.4.2
MINIMUM EXHAUST RATES

REFRIGERANT	Q(m/sec)	Q(cfm)
R32	15.4	32,600
R143	13.6	28,700
R444A	6.46	13,700
R444B	10.6	22,400
R445A	7.83	16,600
R446A	23.9	50,700
R447A	23.8	50,400
R451A	7.04	15,000
R451B	7.05	15,000
R1234yf	7.80	16,600
R1234ze(E)	5.92	12,600

1106.4.3 Emergency ventilation system discharge.

The emergency ventilation system point of discharge to the atmosphere shall be located outside of the structure at not less than 15 feet (4572 mm) above the adjoining grade level and not less than 20 feet (6096 mm) from any window, *ventilation* opening or *exit*.

[F]1106.5 Remote controls.

Remote control of the mechanical *equipment* and *appliances* located in the *machinery room* shall comply with Sections 1106.5.1 and 1106.5.2.

[F]1106.5.1 Refrigeration system emergency shutoff.

A clearly identified switch of the break-glass type or with an approved tamper-resistant cover shall provide off-only control of refrigerant compressors, refrigerant pumps, and normally closed, automatic refrigerant valves located in the *machinery room*. Additionally, this *equipment* shall be automatically shut off whenever the refrigerant vapor concentration in the *machinery room* exceeds the vapor detector's upper detection limit or 25 percent of the LEL, whichever is lower.

[F]1106.5.2 Ventilation system.

A clearly identified switch of the break-glass type or with an approved tamper-resistant cover shall provide on-only control of the *machinery room* ventilation fans.

[F]1106.6 Emergency signs and labels.

Refrigeration units and systems shall be provided with *approved* emergency signs, charts, and labels in accordance with the *International Fire Code*.

SECTION 1107
PIPING MATERIAL

1107.1 Piping.

Refrigerant piping material for other than R-717 (ammonia) systems shall conform to the requirements in this section. Piping material and installations for R-717 (ammonia) refrigeration systems shall comply with IIAR 2.

1107.2 Used materials.

Used pipe, fittings, valves and other materials that are to be reused shall be clean and free from foreign materials and shall be approved for reuse.

1107.3 Materials rating.

Materials, joints and connections shall be rated for the operating temperature and pressure of the refrigerant system. Materials shall be suitable for the type of refrigerant and type of lubricant in the refrigerant system. Magnesium alloys shall not be used in contact with any halogenated refrigerants. Aluminum, zinc, magnesium and their alloys shall not be used in contact with R-40 (methyl chloride).

1107.4 Piping materials standards.

Refrigerant pipe shall conform to one or more of the standards listed in Table 1107.4. The exterior of the pipe shall be protected from corrosion and degradation.

TABLE 1107.4
REFRIGERANT PIPE

PIPING MATERIAL	STANDARD
Aluminum tube	ASTM B210ASTM B491/B491M
Brass (copper alloy) pipe	ASTM B43
Copper linesets	ASTM B280, ASTM B1003
Copper pipe	ASTM B42, ASTM B302
Copper tube[a]	ASTM B68, ASTM B75,ASTM B88, ASTM B280,ASTM B819
Steel pipe[b]	ASTM A53, ASTM A106
Steel tube	ASTM A254, ASTM A334

1. a.Soft annealed copper tubing larger than $1^{3}/_{8}$ inch (35 mm) O.D. shall not be used for field-assembled refrigerant piping unless it is protected from mechanical damage.

2. b.ASTM A53, Type F steel pipe shall not be used for refrigerant lines having an operating temperature less than -20°F (-29°C).

1107.4.1 Steel pipe Groups A2, A3, B2 and B3.

The minimum weight of steel pipe for Group A2, A3, B2 and B3 refrigerants shall be Schedule 80 for sizes $1^{1}/_{2}$ inches or less in diameter.

1107.5 Pipe fittings.

Refrigerant pipe fittings shall be approved for installation with the piping materials to be installed, and shall conform to one of more of the standards *listed* in Table 1107.5 or shall be *listed* and *labeled* as complying with UL 207.

TABLE 1107.5
REFRIGERANT PIPE FITTINGS

FITTING MATERIAL	STANDARD
Aluminum	ASTM B361
Brass (copper alloy)	ASME B16.15, ASME B16.24
Copper	ASME B16.15, ASME B16.18,ASME B16.22, ASME B16.24,ASME B16.26, ASME B16.50
Steel	ASTM A105, ASTM A181,ASTM A193, ASTM A234,ASTM A420, ASTM A707

1107.5.1 Copper brazed field swaged.

The minimum and maximum cup depth of field-fabricated copper brazed swaged fitting connections shall comply with Table 1107.5.1.

TABLE 1107.5.1
COPPER BRAZED SWAGED CUP DEPTHS

FITTING SIZE(inch)	MINIMUM DEPTH(inch)	MAXIMUM DEPTH(inch)
1/8	0.15	0.23
3/16	0.16	0.24
1/4	0.17	0.26
3/8	0.20	0.30
1/2	0.22	0.33
5/8	0.24	0.36
3/4	0.25	0.38
1	0.28	0.42
1 1/4	0.31	0.47
1 1/2	0.34	0.51
2	0.40	0.60
2 1/2	0.47	0.71
3	0.53	0.80
3 1/2	0.59	0.89
4	0.64	0.96

For SI: 1 inch = 25.4 mm.

1107.6 Valves.

Valves shall be of materials that are compatible with the type of piping material, refrigerants and oils in the system. Valves shall be *listed* and *labeled* and rated for the temperatures and pressures of the refrigerant systems in which the valves are installed.

1107.7 Flexible connectors, expansion and vibration compensators.

Flexible connectors and expansion and vibration control devices shall be *listed* and *labeled* for use in refrigerant systems.

SECTION1108
JOINTS AND CONNECTIONS

1108.1 Approval.

Joints and connections shall be of an *approved* type. Joints and connections shall be tight for the pressure of the refrigerant system when tested in accordance with Section 1110.

1108.1.1 Joints between different piping materials.

Joints between different piping materials shall be made with *approved* adapter fittings. Joints between dissimilar metallic piping materials shall be made with a dielectric fitting or a dielectric union conforming to dielectric tests of ASSE 1079. Adapter fittings with threaded ends between different materials shall be joined with thread lubricant in accordance with Section 1108.3.4.

1108.2 Preparation of pipe ends.

Pipe shall be cut square, reamed and chamfered, and shall be free from burrs and obstructions. Pipe ends shall have full-bore openings and shall not be undercut.

1108.3 Joint preparation and installation.

Where required by Sections 1108.4 through 1108.9, the preparation and installation of brazed, flared, mechanical, press-connect, soldered, threaded and welded joints shall comply with Sections 1108.3.1 through 1108.3.5.

1108.3.1 Brazed joints.

Joint surfaces shall be cleaned. An *approved* flux shall be applied where required by the braze filler metal manufacturer. The piping being brazed shall be purged of air to remove the oxygen and filled with one of the following inert gases: oxygen-free nitrogen, helium or argon. The piping system shall be prepurged with an inert gas for a minimum time corresponding to five volume changes through the piping system prior to brazing. The pre-purge rate shall be at a minimum velocity of 100 feet per minute (0.508 m/s). The inert gas shall be directly connected to the tube system being brazed to prevent the entrainment of ambient air. After the pre-purge, the inert gas supply shall be maintained through the piping during the brazing operation at a minimum pressure of 1.0 psi (6.89 kPa) and a maximum pressure of 3.0 psi (20.67 kPa). The joint shall be brazed with a filler metal conforming to AWS A5.8.

1108.3.2 Mechanical joints.

Mechanical joints shall be installed in accordance with the manufacturer's instructions.

1108.3.2.1 Flared joints.

Flared fittings shall be installed in accordance with the manufacturer’s instructions. The flared fitting shall be used with the tube material specified by the fitting manufacturer. The flared tube end shall be made by a tool designed for that operation.

1108.3.2.2 Press-connect joints.

Press-connect joints shall be installed in accordance with the manufacturer’s instructions.

1108.3.3 Soldered joints.

Joint surfaces to be soldered shall be cleaned and a flux conforming to ASTM B813 shall be applied. The joint shall be soldered with a solder conforming to ASTM B32. Solder joints shall be limited to refrigerant systems using Group A1 refrigerant and having a pressure of less than or equal to 200 psi (1378 kPa).

1108.3.4 Threaded joints.

Threads shall conform to ASME B1.1, ASME B1.13M, ASME B1.20.1 or ASME B1.20.3. Thread lubricant, pipe-joint compound or thread tape shall be applied on the external threads only and shall be approved for application on the piping material.

1108.3.5 Welded joints.

Joint surfaces to be welded shall be cleaned by an *approved* procedure. Joints shall be welded with an *approved* filler metal.

1108.4 Aluminum tube.

Joints between aluminum tubing or fittings shall be brazed, mechanical, press-connect or welded joints conforming to Section 1108.3.

1108.5 Brass (copper alloy) pipe.

Joints between brass pipe or fittings shall be brazed, mechanical, press-connect, threaded or welded joints conforming to Section 1108.3.

1108.6 Copper pipe.

Joints between copper or copper-alloy pipe or fittings shall be brazed, mechanical, press-connect, soldered, threaded or welded joints conforming to Section 1108.3.

1108.7 Copper tube.

Joints between copper or copper-alloy tubing or fittings shall be brazed, flared, mechanical, pressconnect or soldered joints.

1108.8 Steel pipe.

Joints between steel pipe or fittings shall be mechanical joints, threaded, press-connect or welded joints conforming to Section 1108.3.

1108.9 Steel tube.

Joints between steel tubing or fittings shall be flared, mechanical, press-connect or welded joints conforming to Section 1108.3.

SECTION1109
REFRIGERANT PIPE INSTALLATION

1109.1 General.

Refrigerant piping installations, other than R-717 (ammonia) refrigeration systems, shall comply with the requirements of this section. The design of refrigerant piping shall be in accordance with ASME B31.5.

1109.2 Piping location.

Refrigerant piping shall comply with the installation location requirements of Sections 1109.2.1 through 1109.2.7. Refrigerant piping for Groups A2L and B2L shall also comply with the requirements of Section 1109.3. Refrigerant piping for Groups A2, A3, B2 and B3 shall also comply with the requirements of Section 1109.4.

1109.2.1 Minimum height.

Exposed refrigerant piping installed in open spaces that afford passage shall be not less than 7 feet 3 inches (2210 mm) above the finished floor.

1109.2.2 Refrigerant pipe enclosure.

Refrigerant piping shall be protected by locating it within the building elements or within protective enclosures.
Exception: Piping protection within the building elements or protective enclosure shall not be required in any of the following locations:

1. Where installed without ready access or located more than 7 feet 3 inches (2210 mm) above the finished floor.
2. Where located within 6 feet (1829 mm) of the refrigerant unit or *appliance*.
3. Where located in a *machinery room* complying with Section 1105.

1109.2.3 Prohibited locations.

Refrigerant piping shall not be installed in any of the following locations:

1. Exposed within a fire-resistance-rated exit access corridor.
2. Within an interior exit stairway.
3. Within an interior exit ramp.
4. Within an exit passageway.
5. Within an elevator, dumbwaiter or other shaft containing a moving object.

1109.2.4 Piping in concrete floors.

Refrigerant piping installed in concrete floors shall be encased in pipe, conduit or ducts. The piping shall be protected to prevent damage from vibration, stress and corrosion.

1109.2.5 Refrigerant pipe shafts.

Refrigerant piping that penetrates two or more floor/ceiling assemblies shall be enclosed in a fire-resistance-rated shaft enclosure. The fire-resistance-rated shaft enclosure shall comply with Section 713 of the *International Building Code*.

Exceptions:

1. Systems using R-718 refrigerant (water).
2. Piping in a direct system using Group A1 refrigerant where the refrigerant quantity does not exceed the limits of Table 1103.1 for the smallest occupied space through which the piping passes.
3. Piping located on the exterior of the building where vented to the outdoors.

1109.2.6 Exposed piping surface temperature.

Exposed piping with ready access having surface temperatures greater than 120°F (49°C) or less than 5°F (-15°C) shall be protected from contact or shall have thermal insulation that limits the exposed insulation surface temperature to a range of 5°F (-15°C) to 120°F (49°C).

1109.2.7 Pipe identification.

Refrigerant pipe located in areas other than the room or space where the refrigerating *equipment* is located shall be identified. The pipe identification shall be located at intervals not exceeding 20 feet (6096 mm) on the refrigerant piping or pipe insulation. The minimum height of lettering of the identification label shall be 1/2 inch (12.7 mm). The identification shall indicate the refrigerant designation and safety group classification of refrigerant used in the piping system. For Group A2, A3, B2 and B3 refrigerants, the identification shall also include the following statement: "DANGER— Risk of Fire or Explosion. Flammable Refrigerant." For any Group B refrigerant, the identification shall also include the following statement: "DANGER—Toxic Refrigerant."

1109.3 Installation requirements for Group A2L or B2L refrigerant.

Piping systems using Group A2L or B2L refrigerant shall comply with the requirements of Sections 1109.3.1 and 1109.3.2.

1109.3.1 Pipe protection.

In addition to the requirements of Section 305.5, aluminum, copper and steel tube used for Group A2L and B2L refrigerants and located in concealed locations where tubing is installed in studs, joists, rafters or similar member spaces, and located less than 1 1/2 inches (38 mm) from the nearest edge of the member, shall be continuously protected by shield plates. Protective steel shield plates having a minimum thickness of 0.0575 inch (1.46 mm) (No. 16 gage) shall cover the area of the tube plus the area extending not less than 2 inches (51 mm) beyond both sides of the tube.

1109.3.2 Shaft ventilation.

Refrigerant pipe shafts with systems using Group A2L or B2L refrigerant shall be naturally or mechanically ventilated. The shaft ventilation exhaust outlet shall comply with Section 501.3.1. Naturally ventilated shafts shall have a pipe, duct or conduit not less than 4 inches (102 mm) in diameter that connects to the lowest point of the

shaft and extends to the outdoors. The pipe, duct or conduit shall be level or pitched downward to the outdoors. Mechanically ventilated shafts shall have a minimum airflow velocity in accordance with Table 1109.3.2. The mechanical ventilation shall be continuously operated or activated by a refrigerant detector. Systems utilizing a refrigerant detector shall activate the mechanical ventilation at a maximum refrigerant concentration of 25 percent of the lower flammable limit of the refrigerant. The detector, or a sampling tube that draws air to the detector, shall be located in an area where refrigerant from a leak will concentrate. The shaft shall not be required to be ventilated for double-wall refrigerant pipe where the interstitial space of the double-wall pipe is vented to the outdoors.

TABLE 1109.3.2
SHAFT VENTILATION VELOCITY

CROSS-SECTIONAL AREA OFSHAFT (square inches)	MINIMUM VENTILATION VELOCITY (feet per minute)
≤ 20	100
> 20 ≤ 250	200
> 250 ≤ 1,250	300
> 1,250	400

For SI: 1 square inch = 645 mm², 1 foot per minute = 0.0058 m/s.

1109.4 Installation requirements for Group A2, A3, B2 or B3 refrigerant.

Piping systems using Group A2, A3, B2 or B3 refrigerant shall comply with the requirements of Sections 1109.4.1 and 1109.4.2.

1109.4.1 Piping material.

Piping material for Group A2, A3, B2 or B3 refrigerant located inside the building, except for *machinery rooms*, shall be copper pipe, brass pipe or steel pipe. Pipe joints located in areas other than the *machinery room* shall be welded. Self-contained *listed* and *labeled equipment* or *appliances* shall have piping material based on the listing requirements.

1109.4.2 Shaft ventilation.

Refrigerant pipe shafts with systems using Group A2, A3, B2 or B3 refrigerant shall be continuously mechanically ventilated. The shaft ventilation exhaust outlet shall comply with Section 501.3.1. Mechanically ventilated shafts shall have a minimum airflow velocity as specified in Table 1109.3.2. The shaft shall not be required to be ventilated for double-wall refrigerant pipe where the interstitial space of the doublewall pipe is vented to the outdoors.

1109.5 Refrigerant pipe penetrations.

The annular space between the outside of a refrigerant pipe and the inside of a pipe sleeve or opening in a building envelope wall, floor or ceiling assembly penetrated by a refrigerant pipe shall be sealed in an *approved* manner with caulking material or foam sealant or closed with a gasketing system. The caulking material, foam sealant or gasketing system shall be designed for the conditions at the penetration location and shall be compatible with the

pipe, sleeve and building materials in contact with the sealing materials. Refrigerant pipes penetrating fire-resistance-rated assemblies or membranes of fire-resistance-rated assemblies shall be sealed or closed in accordance with Section 714 of the *International Building Code*.

1109.6 Stress and strain.

Refrigerant piping shall be installed so as to prevent strains and stresses that exceed the structural strength of the pipe. Where necessary, provisions shall be made to protect piping from damage resulting from vibration, expansion, contraction and structural settlement.

1109.7 Condensate control.

Refrigerating piping and fittings that, during normal operation, will reach a surface temperature below the dew point of the surrounding air, and are located in spaces or areas where condensation has the potential to cause a safety hazard to the building occupants, structure, electrical *equipment* or any other *equipment* or *appliances*, shall be insulated or protected in an *approved* manner to prevent damage from condensation.

1109.8 Stop valves.

Stop valves shall be installed in specified locations in accordance with Sections 1109.8.1 and 1109.8.2. Stop valves shall be supported in accordance with Section 1109.8.3 and identified in accordance with Section 1109.8.4.

Exceptions:

1. Systems that have a refrigerant pumpout function capable of storing the entire refrigerant charge in a receiver or heat exchanger.
2. Systems that are equipped with provisions for pumping out the refrigerant using either portable or permanently installed refrigerant recovery *equipment*.
3. Self-contained *listed* and *labeled* systems.

1109.8.1 Refrigerating systems containing more than 6.6 pounds (3.0 kg) of refrigerant.

Stop valves shall be installed in the following locations on refrigerating systems containing more than 6.6 pounds (3.0 kg) of refrigerant:

1. The suction inlet of each compressor, compressor unit or condensing unit.
2. The discharge outlet of each compressor, compressor unit or condensing unit.
3. The outlet of each liquid receiver.

1109.8.2 Refrigerating systems containing more than 100 pounds (45 kg) of refrigerant.

In addition to stop valves required by Section 1109.8.1, systems containing more than 100 pounds (45 kg) of refrigerant shall have stop valves installed in the following locations:

1. Each inlet of each liquid receiver.
2. Each inlet and each outlet of each condenser where more than one condenser is used in parallel.

Exceptions:

1. Stop valves shall not be required at the inlet of a receiver in a condensing unit nor at the inlet of a receiver that is an integral part of the condenser.
2. Systems utilizing nonpositive displacement compressors.

1109.8.3 Stop valve support.

Stop valves shall be supported to prevent detrimental stress and strain on the refrigerant piping system. The piping system shall not be utilized to support stop valves on copper tubing or aluminum tubing 1 inch (25.4 mm) outside diameter or larger.

1109.8.4 Identification.

Stop valves shall be identified where their intended purpose is not obvious. Where valves are identified by a numbering or lettering system, legend(s) or key(s) for the valve identification shall be located in the room containing the indoor refrigeration *equipment*. The minimum height of lettering of the identification label shall be $^1/_2$ inch (12.7 mm).

SECTION1110
REFRIGERATION PIPING SYSTEM TEST

1110.1 General.

Refrigerant piping systems, other than R- 717 (ammonia) refrigeration systems, that are erected in the field shall be pressure tested for strength and leak tested for tightness, in accordance with the requirements of this section, after installation and before being placed in operation. Tests shall include both the high- and low-pressure sides of each system.

Exception: *Listed* and *labeled equipment*, including compressors, condensers, vessels, evaporators, gas bulk storage tanks, safety devices, pressure gauges and control mechanisms, shall not be required to be tested.

1110.2 Exposure of refrigerant piping system.

Refrigerant pipe and joints installed in the field shall be exposed for visual inspection and testing prior to being covered or enclosed.

1110.3 Test gases.

The medium used for pressure testing the refrigerant system shall be one of the following inert gases: oxygen-free nitrogen, helium or argon. For R-744 refrigerant systems, carbon dioxide shall be allowed as the test medium. For R-718 refrigerant systems, water shall be allowed as the test medium. Oxygen, air, combustible gases and mixtures containing such gases shall not be used as a test medium. Systems erected on the premises with tubing not exceeding $^{5}/_{8}$ inch (15.9 mm) outside diameter shall be allowed to use the refrigerant identified on the nameplate label or marking as the test medium.

1110.4 Test apparatus.

The means used to pressurize the refrigerant piping system shall have on its outlet side a test pressure measuring device and either a pressure-limiting device or a pressure-reducing device. The test pressure measuring device shall have an accuracy of ±3 percent or less of the test pressure and shall have a resolution of 5 percent or less of the test pressure.

1110.5 Piping system pressure test and leak test.

The refrigerant piping system shall be tested as a whole or separate tests shall be conducted for the low-pressure side and high-pressure side of the piping system. The refrigerant piping system shall be tested in accordance with both of the following methods:

1. The system shall be pressurized for a period of not less than 60 minutes to not less than the lower of the design pressures or the setting of the pressure relief device(s). The design pressures for testing shall be the pressure *listed* on the label nameplate of the condensing unit, compressor, compressor unit, pressure vessel or other system component with a nameplate. Additional test gas shall not be added to the system after the start of the pressure test. The system shall not show loss of pressure on the test pressure measuring device during the pressure test. Where using refrigerant as a test medium in accordance with Section 1110.3, the test pressure shall be not less than the saturation dew point pressure at 77°F (25°C).
2. A vacuum of 500 microns shall be achieved. After achieving a vacuum, the system shall be isolated from the vacuum pump. The system pressure shall not rise above 1,500 microns for a period of not less than 10 minutes.

1110.5.1 Joints and refrigerant-containing parts in air ducts.

Joints and all refrigerant-containing parts of a refrigerating system located in an air duct of an air-conditioning system that conveys conditioned air to and from human-occupied spaces shall be tested at a pressure of 150 percent of the higher of the design pressure or pressure relief device setting.

1110.5.2 Limited charge systems.

Limited charge systems with a pressure relief device, erected on the premises, shall be tested at a pressure not less than one and one-half times the pressure setting of the relief device. *Listed* and *labeled* limited charge systems shall be tested at the *equipment* or *appliance* design pressure.

1110.6 Booster compressor.

Where a compressor protected by a pressure relief device is used as a booster to obtain an intermediate pressure, and such compressor discharges into the suction side of another compressor, the booster compressor shall be considered to be a part of the low-pressure side of the system.

1110.7 Centrifugal/nonpositive displacement compressors.

Where testing systems using centrifugal or other nonpositive displacement compressors, the entire system shall be considered to be the low-pressure side for test purposes.

1110.8 Contractor or engineer declaration.

The installing contractor or *registered design professional* of record shall issue a certificate of test to the code official for all systems containing 55 pounds (25 kg) or more of refrigerant. The certificate shall give the test date, name of the refrigerant, test medium and the field test pressure applied to the high pressure side and the low-pressure side of the system. The certification of test shall be signed by the installing contractor or *registered design professional* and shall be made part of the public record.

[F] SECTION1111
PERIODIC TESTING

[F]1111.1Testing required.
The following emergency devices and systems shall be periodically tested in accordance with the manufacturer's instructions and as required by the code official:

1. 1.Treatment and flaring systems.
2. 2.Valves and appurtenances necessary to the operation of emergency refrigeration control boxes.
3. 3.Fans and associated *equipment* intended to operate emergency ventilation systems.
4. 4.Detection and alarm systems.

Amend Chapter 15 adding as follows (ME-21-05-23-R1):

ASHRAE
15-~~2016~~2022, Safety Standard for Refrigeration Systems
34-~~2016~~2022, Designation and Safety Classification of Refrigerants

CEN European Committee for Standardization

CEN-CENELEC Management Centre
Rue de la Science 23
B - 1040 Brussels, Belgium
Tel: + 32 2 550 08 11
Fax: + 32 2 550 08 19

EN European Standard

303-5 Heating Boilers-Part 5: Heating Boilers for Solid-Fuels, Manually and Automatically Stoked, Nominal Heat Output of Up to 500Kw – Terminology, Requirements, Testing and Marking (2022)

UL

UL/CSA 60335-2-40-2022, HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY – PART 2-40: PARTICULAR REQUIREMENTS FOR ELECTRICAL HEAT PUMPS, AIR CONDITIONERS AND DEHUMIDIFIERS

UL/CSA 60335-2-89-2021, HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY – PART 2-89: PARTICULAR REQUIREMENTS FOR COMMERCIAL REFRIGERATING APPLIANCES AND ICE-MAKERS WITH AN INCORPORATED OR REMOTE REFRIGERANT UNIT OR MOTOR-COMPRESSOR

End of *International Mechanical Code*® 2021 amendments

International Plumbing Code® 2021 amendments

Amend Section 101.1 as follows (PL-21-01-23):

101.1 Title. These regulations shall be known as the Plumbing Code of ~~[NAME OF JURISDICTION]~~ the State of New Hampshire hereinafter referred to as "this code."

Amend Section 101.2 as follows (PL-21-08-23):

101.2 Scope. [No change]
101.2.1 Appendices. The following appendices are hereby adopted:
101.2.1.1 Appendix B – Rates of Rainfall for Various Cities
101.2.1.2 Appendix C – Structural Safety

Amend Section 102.8 as follows (PL-21-13-23):

102.8 Referenced codes and standards. The codes and standards referenced herein shall be those that are listed in Chapter 15 and such codes and standards shall be considered as part of the requirements of this code to the prescribed extent of each such reference and as further regulated in Sections 102.8.1 ~~and 102.8.2~~through 102.8.12.
Exception: Where enforcement of a code provision would violate the conditions of the listing of the equipment or appliance, the conditions of the listing and the manufacturer's installation instructions shall apply.
102.8.1 Conflicts. Where conflicts occur between provisions of this code and the referenced standards, the provisions of this code shall apply.
102.8.2 Provisions in referenced codes and standards.
Where the extent of the reference to a referenced code or standard includes subject matter that is within the scope of this code, the provisions of this code, as applicable, shall take precedence over the provisions in the referenced code or standard.
102.8.3 Building. Reference in this code to the International Building Code are deemed references to the New Hampshire Building Code, RSA 155-A:1,IV.
102.8.4 Existing buildings. The provisions of the International Existing Building Code, as amended, shall apply to matters governing the repair, alteration, change of occupancy, addition to and relocation of existing buildings.
102.8.5 Gas. ~~The provisions of the International Fuel Gas Code shall apply to the installation of gas piping from the point of delivery, gas appliances and related accessories as covered in this code. These requirements apply to gas piping systems extending from the point of delivery to the inlet connections of appliances and the installation and operation of residential and commercial gas appliances and related accessories.~~ The International Fuel Gas Code is not adopted by RSA 155-A:1,IV. Fuel gas systems shall comply with the New Hampshire Fire Code, pursuant to RSA 153:1, as amended in Saf-FMO 300. Fuel gas provisions are enforced by the building code official and the fire code official.
101.8.6 Private Sewage Disposal Systems. The International Privage Sewage Disposal System Code is not adopted by RSA 155-A:1,IV. The provisions of RSA 485-A shall apply to private sewage disposal systems. These provisions are enforced by the Department of Environmental Services.
101.8.7 Mechanical. The provisions of the *International Mechanical Code* ,as amended, shall apply to the installation, *alterations*, *repairs* and replacement of mechanical systems, including equipment, appliances, fixtures, fittings and appurtenances, including ventilating, heating, cooling, air-conditioning and refrigeration systems, incinerators and other energy-related systems.
102.8.8 Fire prevention. ~~The provisions of the International Fire Code shall apply to matters affecting or relating to structures, processes and premises from the hazard of fire and explosion arising from the storage, handling or use of structures, materials or devices; from conditions hazardous to life, property or public welfare in the occupancy of structures or premises; and from the construction, extension, repair, alteration or removal of fire suppression, automatic sprinkler systems and alarm systems or fire hazards in the structure or on the premises from occupancy or operation.~~ The International Fire Code is not adopted by RSA 155-A:1,IV. References in this code to the International Fire Code are deemed references to the New Hampshire Fire Code, pursuant to RSA 153:1 as amended in Saf-FMO 300. These provisions are enforced by the building code official and by the fire code official.

102.8.9 Energy. The provisions of the International Energy Conservation Code, as amended, shall apply to all matters governing the design and construction of buildings for energy efficiency.
102.8.10 Residential Code. References to the International Residential Code in this code are deemed references to the New Hampshire Building Code, RSA 155-A:1,IV.
102.8.11 NFPA Standards except NFPA 70. References to NFPA standards in this code, except for NFPA 70, shall be deemed references to the edition cited in the New Hampshire Fire Code pursuant to RSA 153:1, as amended in Saf FMO-300. NFPA standards referenced by this code are enforced by the building code official and the fire code official.
102.8.12 NFPA 70. References to NFPA 70, National Electrical Code, in this code are deemed references to the New Hampshire Building Code, RSA 155-A:1,IV.

Amend Section 109 as follows (PL-21-02-23):

109.1 ~~Payment of fees.~~ Fee schedule. Fees for mechanical work shall be as established by the local jurisdiction.
~~A permit shall not be valid until the fees prescribed by law have been paid. An amendment to a permit shall not be released until the additional fee, if any, has been paid.~~
~~**109.2 Schedule of permit fees.** Where work requires a permit, a fee for each permit shall be paid as required, in accordance with the schedule as established by the applicable governing authority.~~
~~**109.3 Work commencing before permit issuance.** Any person who commences any work on a plumbing system before obtaining the necessary permits shall be subject to a fee established by the code official that shall be in addition to the required permit fees.~~
~~**109.4 Related fees.** The payment of the fee for the construction, alteration, removal or demolition for work done in connection to or concurrently with the work authorized by a permit shall not relieve the applicant or holder of the permit from the payment of other fees that are prescribed by law~~
~~**109.5 Refunds.** The code official is authorized to establish a refund policy~~

Amend Section 115.4 as follows (PL-21-03-23):

115.4 Violation penalties. Any person who shall violate a provision of this code or shall fail to comply with any of the requirements thereof or who shall erect, install, alter or repair plumbing work in violation of the approved construction documents or directive of the code official, or of a permit or certificate issued under the provisions of this code, shall be subject to penalties as prescribed by law ~~guilty of a [SPECIFY OFFENSE], punishable by a fine of not more than [AMOUNT] dollars or by imprisonment not exceeding [NUMBER OF DAYS], or both such fine and imprisonment~~. Each day that a violation continues after due notice has been served shall be deemed a separate offense.

Amend Section 116.4 as follows (PL-21-04-23):

116.4 Failure to comply. Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be subject to ~~fines established by the authority having jurisdiction~~penalties as prescribed by law.

Amend Section 202 as follows (PL-21-14-23):

BUILDING SEWER. That part of the drainage system that extends from the end of the *building drain* to the first fitting beyond the foundation wall of the building or 5 feet of pipe from the building, and conveys the discharge to a *public sewer*, *private sewer*, individual sewage disposal system or other point of disposal.
Combined. A *building sewer* that conveys both sewage and storm water or other drainage.
Sanitary. A *building sewer* that conveys sewage only.
Storm. A *building sewer* that conveys storm water or other drainage, but not sewage.

Amend Section 305.4.1 as follows (PL-21-05-23):

305.4.1Sewer depth. Building sewers that connect to private sewage disposal systems shall ~~be installed not less than [NUMBER] inches (mm) below finished grade at the point of septic tank connection~~conform to RSA 485-A relative to minimum depth below finished grade. Building sewers that connect to public sewers shall be installed not less than ~~[NUMBER]~~ 48 inches (1219 mm) below grade or adequately insulated to afford the same protection whenever a condition arises that the 48 inches (1219 mm) cannot be attained.

Amend Section 312 as follows (PL-21-12-23):

312.1 – 312.2 [no change]
312.3 Drainage and vent air test. ~~Plastic piping shall not be tested using air.~~ An air test shall be made by forcing air into the system until there is a uniform gauge pressure of 5 psi (34.5 kPa) or sufficient to balance a 10-inch (254 mm) column of mercury. This pressure shall be held for a test period of not less than 15 minutes. Any adjustments to the test pressure required because of changes in ambient temperatures or the seating of gaskets shall be made prior to the beginning of the test period.
312.3.1 Plastic piping drainage and vent testing. Plastic piping shall not be tested using air. Plastic piping shall be tested using water in accordance with Section 312.2 or by using a vacuum test. The portion under a vacuum test shall be evacuated of air by a vacuum-type pump to achieve a uniform gauge pressure of -5 pounds per square inch or a negative 10 inches of mercury column (-34 kPa). This pressure shall be held without the removal of additional air for a period of 15 minutes.
312.4 – 312.7 [no change]
312.8 Storm drain systems within a building shall be tested by water ~~or ,~~ air or vacuum in accordance with Section 312.2, ~~or~~ 312.3 or 312.3.1.
312.9 – 312.10 [no change]

Amend Section 701.2 as follows (PL-21-09-23):

701.2 Connection to sewer required.
Sanitary drainage piping from plumbing fixtures in buildings and sanitary drainage piping systems from premises shall be connected to a public sewer. Where a public sewer is not available, the sanitary drainage piping and systems shall be connected to a private sewage disposal system in compliance with state or local requirements. ~~Where state or local requirements do not exist for private sewage disposal systems, the sanitary drainage piping and systems shall be connected to an approved private sewage disposal system that is in accordance with the International Private Sewage Disposal Code.~~ Building sewers serving private sewers and individual sewage disposal systems are not regulated by this code but are regulated by the New Hampshire Department of Environmental Services (NHDES).
Drainage system piping that conveys discharge from one building to another building on the same lot shall be considered an extension of the building drain.
Exception: Sanitary drainage piping and systems that convey only the discharge from bathtubs, showers, lavatories, clothes washers and laundry trays shall not be required to connect to a public sewer or to a private sewage disposal system provided that the piping or systems are connected to a system in accordance with Chapter 13 or 14.

Amend Section 705.10.2 as follows (PL-21-06-23):

705.10.2 Solvent cementing. Joint surfaces shall be clean and free from moisture. A ~~purple~~ primer that conforms to ASTM F656 shall be applied. Solvent cement not purple in color and conforming to ASTM D2564, CSA B137.3, CSA B181.2 or CSA B182.1 shall be applied to all joint surfaces. The joint shall be made while the cement is wet and shall be in accordance with ASTM D2855. Solvent-cement joints shall be permitted above or below ground.
Exception: A primer is not required where both of the following conditions apply:
The solvent cement used is third-party certified as conforming to ASTM D2564.
The solvent cement is used only for joining PVC drain, waste and vent pipe and fittings in nonpressure applications in sizes up to and including 4 inches (102 mm) in diameter.

Amend Section 802.1.7 as follows (PL-21-10-23):

802.1.7 Food Utensils, dished, pots and pans sinks. Sinks, in other than dwelling unit, used for the washing, rinsing or sanitizing of utensils, dishes, pots, pans, or service ware used in the preparation, serving or eating of food shall discharge indirectly through an *air gap* or an *air break* to the drainage system. Wash and rinse bays or sinks shall be permitted to discharge indirectly or directly to the drainage system.

Amend Section 903.1.1 as follows (PL-21-07-23):

903.1.1 Roof extension unprotected. Open vent pipes that extend through a roof shall be terminated not less than ~~[NUMBER]~~18 inches (457 mm) above the roof.

Add Section 1003.3.5.3 as follows (PL-21-11-23):

1003.3.5.3 Exclusive use of Hydromechanical Grease Interceptor Exclusive use of a hydromechanical grease interceptor being served by a DES approved septic system shall be approved by DES for such use.

End of *International Plumbing Code*® 2021 amendments

Amend Section R101.1 as follows (RE-21-01-23):

R101.1Title. These provisions shall be known as the Residential Code for One- and Two-family Dwellings of ~~[NAME OF JURISDICTION]~~the State of New Hampshire, and shall be cited as such and will be referred to herein as "this code."

Add Section R101.3.1 as follows (RE-21-02-23):

R101.3.1 Toilet Facilities for Workers. Toilet facilities shall be provided for construction workers and such facilities shall be maintained in a sanitary condition. Construction worker toilet facilities of the non-sewer type shall conform to ANSI Z4.3.

Amend Section R102.4 as follows (RE-21-25-23):

R102.4 Referenced codes and standards. The codes and standards referenced in this code shall be considered part of the requirements of this code to the prescribed extent of each such reference and as further regulated in Sections R102.4.1 and R102.4.2.

Exception: Where enforcement of a code provision would violate the conditions of the *listing* of the *equipment* or *appliance*, the conditions of the *listing* and manufacturer's instructions shall apply.

R102.4.1 Conflicts.

Where conflicts occur between provisions of this code and referenced codes and standards, the provisions of this code shall apply.

R102.4.2 Provisions in referenced codes and standards.

Where the extent of the reference to a referenced code or standard includes subject matter that is within the scope of this code, the provisions of this code, as applicable, shall take precedence over the provisions in the referenced code or standard.

R102.4.3 Building. Reference in this code to the International Building Code are deemed references to the New Hampshire Building Code, RSA 155-A:1,IV

R102.4.4 Gas. The International Residential Code fuel gas provisions are not adopted by RSA 155-A:1,IV. Fuel gas systems shall comply with the New Hampshire Fire Code, pursuant to RSA 153:1, as amended in Saf-FMO 300. Fuel gas provisions are enforced by the building code official and the fire code official.

R102.4.5 Plumbing. References in this code to the International Plumbing Code are deemed references to the New Hampshire Building Code, RSA 155-A:1,IV.

R102.4.6 Private Sewage Disposal Systems. The International Private Sewage Disposal System Code is not adopted by RSA 155-A:1,IV. The provisions of RSA 485-A shall apply to private sewage disposal systems. These provisions are enforced by the Department of Environmental Services.

R102.4.7 Property maintenance. The International Property Maintenance Code is not adopted by RSA 155-A:1,IV.

R102.4.8 Fire prevention. The International Fire Code is not adopted by RSA 155-A:1,IV. References in this code to the International Fire Code are deemed references to the New Hampshire Fire Code, pursuant to RSA 153:1 as amended in Saf-FMO 300. These provisions are enforced by the building code official and by the fire code official.

R102.4.9 Energy. References in this code to the International Energy Conservation Code are deemed references to the New Hampshire Building Code, RSA 155-A:1,IV, except that references to the 2006 International Energy Conservation Code are deemed references to the 2006 International Energy Conservation Code, as amended during the period this code was applicable in New Hampshire.

R102.4.10 NFPA Standards except NFPA 70. References to NFPA standards in this code, except for NFPA 70, shall be deemed references to the edition cited in the New Hampshire Fire Code pursuant to RSA 153:1, as amended in Saf FMO-300. NFPA standards referenced by this code are enforced by the building code official and the fire code official.

Amend Section R102.5 as follows (RE-21-17-23):

R102.5 Appendices. Provisions in the appendices shall not apply unless specifically referenced in the adopting ordinance.

102.5.1 Appendices. The following appendices are hereby adopted:
102.5.1.1 Appendix AJ – Existing Buildings and Structures
102.5.1.2 Appendix AQ – Tiny Houses

Amend Section R105.2 as follows (RE-21-03-23-R1):

R105.2 Work exempt from permit.
Exemption from permit requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction. Permits shall not be required for the following:
Building:
Other than storm shelters, one-story detached accessory structures, provided that the floor area does not exceed ~~200~~400 square feet (18.58 m^2).
1.1 Tents of any size erected as an accessory structure on property that is an owner occupied one or two family dwelling.
[remainder of section unchanged]

Amend Section R202 adding the definitions as follows (RE-21-04-23-R1 and RE-21-32-23-R2):

BIOMASS. As defined in New Hampshire Administrative Rules Env-A 1401.03(d).

BIOMASS FUEL. For use in this section, biomass fuels are defined as "solid" organic matter, not including woods derived from construction or demolition debris; wood that has been chemically treated; or agricultural crops or aquatic plants or byproducts from such crops or plants which have been used to rehabilitate a contaminated or brownfields site through a process known as "phytoremediation".

Recovery House. A primarily non-transient dwelling or dwelling unit that provides a substance-free living environment that supports individuals in recovery from addiction and living as a single household and as more aptly defined in RSA 153:10-d II. Recovery housing shall not include boarding house, rooming house, halfway house or any other facility requiring a license.

Amend Section R202 as follows (RE-21-04-23-R1 and RE-21-20-23):

BUILDING SEWER. That part of the drainage system that extends from the end of the *building drain* to the first fitting beyond the foundation wall of the building or 5 feet of pipe from the building, and conveys its discharge to a public sewer, private sewer, individual sewage-disposal system or other point of disposal.

[MP] BUILDING DRAIN. The lowest piping that collects the discharge from all other drainage piping inside the house and extends 30 inches (762 mm) in *developed length* of pipe, beyond the exterior walls and conveys the drainage to the *building sewer*. Drainage system piping that conveys discharge from one building to another building on the same lot shall be considered an extension of the building drain.

[MP] BUILDING SEWER. That part of the drainage system that extends from the end of the *building drain* and conveys its discharge to a public sewer, private sewer, individual sewage-disposal system or other point of disposal. Building sewers serving private sewers and individual sewage disposal systems are not regulated by this code but are regulated by the New Hampshire Department of Environmental Services (NHDES).

Amend TABLE R301.2(1) as follows (RE-21-05-23-R1):

TABLE R301.2(1)
CLIMATIC AND GEOGRAPHIC DESIGN CRITERIA

GROUND SNOW LOAD[p]	WIND DESIGN				SEISMIC DESIGN CATEGORY[f]	SUBJECT TO DAMAGE FROM			WINTER DESIGN TEMP[e]	ICE BARRIER UNDERLAYMENT REQUIRED[h]	FLOOD HAZARDS[g]	AIR FREEZING INDEX[i]	MEAN ANNUAL TEMP[j]
	Speed[d] (mph)	Topographic effects[k]	Special wind region[l]	Windborne debris zone[m]		Weathering[a]	Frost line depth[b]	Termite[c]					
—	—	—	—	—	—	—	—	—	—	—	—	—	—

MANUAL J DESIGN CRITERIA[n]

Elevation	Lattitude	Winter heating	Summer cooling	Altitude correction factor	Indoor design temperature	Design temperature cooling	Heating temperature difference
—	—	—	—	—	—	—	—
Cooling temperature difference	Wind velocity heating	Wind velocity cooling	Coincident wet bulb	Daily range	Winter humidity	Summer humidity	—
—	—	—	—	—	—	—	—

Note p. The jurisdiction shall fill in this section of the table using the Ground Snow ~~Loads in Figures R301.2(3) and R301.2(4)~~from Table 1 of *Ground Snow Loads for New Hampshire* ERDC/CRREL TR-02-6.

Amend Section R302.13 as follows (RE-21-27-23):

R302.13 Fire protection of floors. Floor assemblies that are not required elsewhere in this code to be fire-resistance rated, shall be provided with a 1/2-inch (12.7 mm) gypsum wallboard membrane, 5/8-inch (16 mm) wood structural panel membrane, or equivalent on the underside of the floor framing member. Penetrations or openings for ducts, vents, electrical outlets, lighting, devices, luminaires, wires, speakers,
drainage, piping and similar openings or penetrations shall be permitted.

Exceptions:

1. Floor assemblies located directly over a space protected by an automatic sprinkler system in accordance with Section P2904, NFPA 13D, or other approved equivalent sprinkler system.
2. Floor assemblies located directly over a crawl space not intended for storage or for the installation of fuel-fired or electric-powered heating appliances.
3. Portions of floor assemblies shall be permitted to be unprotected where complying with the following:
3.1. The aggregate area of the unprotected portions does not exceed 80 square feet (7.4 m^2) per story
3.2. Fireblocking in accordance with Section R302.11.1 is installed along the perimeter of the unprotected portion to separate the unprotected portion from the remainder of the floor assembly.
4. Wood floor assemblies using dimension lumber or structural composite lumber equal to or greater than 2-inch by 10-inch (50.8 mm by 254 mm) nominal dimension, or other approved floor assemblies demonstrating equivalent fire performance.
5. Floor assemblies having been protected by an alternative method that has been evaluated as meeting the criteria for alternative methods of construction as outlined in Section R104.11.

Amend Section R310.1 as follows (RE-21-06-23):

R310.1 Emergency escape and rescue opening required. Basements, habitable attics and every sleeping room shall have not less than one operable emergency escape and rescue opening. Where basements contain one or more sleeping rooms, an emergency escape and rescue opening shall be required in each sleeping room. Emergency escape and rescue openings shall open directly into a public way, or to a yard or court having a minimum width of 36 inches (914 mm) that opens to a public way.

Exceptions:

Storm shelters and basements used only to house mechanical equipment not exceeding a total floor area of 200 square feet (18.58 m2).
Where the dwelling unit or townhouse unit is equipped with an automatic sprinkler system installed in accordance with Section P2904, sleeping rooms in basements shall not be required to have emergency escape and rescue openings provided that the basement has one of the following:
One means of egress complying with Section R311 and one emergency escape and rescue opening.
Two means of egress complying with Section R311.
A yard shall not be required to open directly into a public way where the yard opens to an unobstructed path from the yard to the public way. Such path shall have a width of not less than 36 inches (914 mm).

Emergency escape and rescue openings required by Section 310.1 are permitted to be omitted where the building is protected by a sprinkler system complying with Section R313.

Amend Section R313.2 as follows (RE-21-07-23):

R313.2 One- and two-family dwellings automatic fire systems. An automatic residential fire sprinkler system shall not be ~~installed~~ required in one- and two-family *dwellings*.
~~**Exception:** An automatic residential fire sprinkler system shall not be required for *additions* or *alterations* to existing buildings that are not already provided with an automatic residential sprinkler system.~~
R313.2.1 Design and installation. Automatic residential fire sprinkler systems shall be designed and installed in accordance with Section P2904 or NFPA 13D.
R313.2.2 One- and Two-Family dwellings automatic fire systems. *Dwellings* provided with an automatic residential fire sprinkler system shall be allowed to exercise all credits regarding egress in accordance with RSA 155-A:2 II.

Add Section R320.3 as follows (RE-21-31-23):

R320.3 Certification. The certifications required by NH RSA 155-A:5, both for *construction documents* and at the completion of construction, shall be submitted to the *building official* prior to the issuance of the certificate of occupancy.

Amend Section R324.6 as follows (RE-21-18-23-R1):

R324.6 Roof access and pathways. Roof access, pathways and setback requirements shall be provided in accordance with Sections R324.6.1 through R324.6.2.1. Access and minimum spacing shall be required to provide emergency access to the roof, to provide pathways to specific areas of the roof, provide for smoke ventilation opportunity areas, and to provide emergency egress from the roof.
Exceptions:
Detached, nonhabitable structures, including but not limited to detached garages, parking shade structures, carports, solar trellises and similar structures, shall not be required to provide roof access.
Roof access, pathways and setbacks need not be provided where the code official has determined that rooftop operations will not be employed.
These requirements shall not apply to roofs with slopes of 2 units vertical in 12 units horizontal (17-percent slope) or less.
BIPV systems *listed* in accordance with Section 690.12(B)(2) of NFPA 70, where the removal or cutting away of portions of the BIPV system during fire-fighting operations has been determined to not expose a fire fighter to electrical shock hazards.
Access pathways are not required where PV arrays occupy up to 50 percent of the plan view roof area with a common horizontal ridge.
R324.6.1 Pathways.
Not fewer than two pathways, on separate roof planes from lowest roof edge to ridge and not less than 36 inches (914 mm) wide, shall be provided on all buildings. Not fewer than one pathway shall be provided on the street or driveway side of the roof. For each roof plane with a photovoltaic array, a pathway not less than 36 inches wide (914 mm) shall be provided from the lowest roof edge to ridge on the same roof plane as the photovoltaic array, on an adjacent roof plane, or straddling the same and adjacent roof planes. Pathways shall be over areas capable of supporting fire fighters accessing the roof. Pathways shall be located in areas with minimal obstructions such as vent pipes, conduit, or mechanical equipment.
Exception: Access pathways are not required where PV arrays occupy up to 50 percent of the plan view roof area with a common horizontal ridge.
R324.6.2 Setback at ridge. For photovoltaic arrays occupying not more than ~~33~~ 50 percent of the plan view total roof area with a common horizontal ridge, not less than an 18-inch (457 mm) clear setback is required on both sides of a horizontal ridge. For photovoltaic arrays occupying more than ~~33~~ 50 percent of the plan view total roof area with a common horizontal ridge, not less than a 36-inch (914 mm) clear setback is required on both sides of a horizontal ridge.
R324.6.3 Emergency Escape and Rescue Openings. [No change]

Amend Section M2001.1.1 as follows (RE-21-08-23):

M2001.1.1 Standards. Packaged oil-fired boilers shall be *listed* and *labeled* in accordance with UL 726. Packaged electric boilers shall be *listed* and *labeled* in accordance with UL 834. Solid fuel-fired boilers shall be *listed* and *labeled* in accordance with UL 2523. Boilers shall be designed, constructed and certified in accordance with the ASME *Boiler and Pressure Vessel Code,* Section I or IV. Controls and safety devices for boilers with fuel input ratings of 12,500,000 Btu/hr (3663 kW) or less shall meet the requirements of ASME CSD-1. Gas-fired boilers shall conform to the requirements listed in Chapter 24. Solid Fuel-Burning Boilers listed and conforming to European Committee for Standardization EN 303-5 "Heating Boilers – Part 5: Heating Boilers for Solid-Fuels, Manually and Automatically Stoked, Nominal Heat Output of Up to 300 Kw – Terminology, Requirements, Testing and Marking" shall be permitted for biomass fuels when all data plates; warning labels; limits on temperature and pressure of relief valves; installation, operations, and maintenance manuals; all operating and safety gauges and controls; and construction and emissions specification documents are provided in English using U.S. customary system units of measurement. All pipe connections shall meet the North American ASTM standards for pipe and fittings.

Delete Chapter 11 in its entirety and add the following (RE-21-26-23):

CHAPTER 11
ENERGY EFFICIENCY
Delete Chapter 11 in its entirety and replace with the following:
N1101.1 Buildings shall be designed and constructed in accordance with the International Energy Conservation Code, as amended, per the New Hampshire Building Code, RSA 155-A:1,IV

Delete Chapter 24 in its entirety and add the following (RE-21-10-23):

CHAPTER 24
FUEL GAS
Delete Chapter 24 in its entirety and replace with the following:
G2401.1. Fuel gas systems shall comply with the New Hampshire State Fire Code as amended.

Amend Section P2603.5.1 as follows (RE-21-11-23):

P2603.5.1 Sewer depth. Building sewers that connect to private sewage disposal systems shall conform to RSA 485-A relative to minimum depth below finished grade~~be a minimum of [NUMBER] inches (mm) below finished grade at the point of septic tank connection~~. Building sewers that connect to public sewers shall be a minimum depth of ~~[NUMBER]~~48 inches (1219 mm) below grade or adequately insulated to afford the same protection whenever a condition arises that the 48 inches (1219 mm) cannot be attained.

Amend Section P2903.10 as follows (RE-21-12-23):

P2903.10 Hose bibb. Hose bibbs subject to freezing, including the "frost-proof" type, shall be equipped with an accessible stop-and-waste-type valve inside the building so that they can be controlled and/or drained during cold periods. ~~**Exception:** Frostproof hose bibbs installed such that the stem extends through the building insulation into an open heated or semi-conditioned space need not be separately valved (see Figure P2903.10).~~

Amend Section P3003.9.2 as follows (RE-21-13-23):

P3003.9.2 Solvent cementing. Joint surfaces shall be clean and free from moisture. ~~A purple primer, or other~~An *approved* primer, that conforms to ASTM F 656 shall be applied. Solvent cement not purple in color and conforming to ASTM D 2564 or CSA B137.3, CSA B181.2 shall be applied to all joint surfaces. The joint shall be made while the cement is wet and shall be in accordance with ASTM 2855. Solvent-cement joints shall be permitted above or below ground.

Amend Section P3103.1.1 as follows (RE-21-14-23):

P3103.1.1 Roof extension. Open vent pipes that extend through a roof that do not meet the conditions of Section P3103.1.2 or P3103.1.3 shall terminate not less than ~~6~~ 18 inches (457 mm) above the roof or 6 inches (457 mm) above the anticipated snow accumulation, whichever is greater.

Delete Chapters 34 – 43 in their entirety and add the following (RE-21-15-23):

Delete Chapters 34 – 43 in their entirety and refer to the National Electrical Code as referenced in RSA 155-A:1, IV.

Amend Chapter 44 as follows (RE-21-24-23):

ASHRAE

34-~~2016~~2022, Designation and Safety Classification of Refrigerants

CEN European Committee for Standardization

CEN-CENELEC Management Centre
Rue de la Science 23
B - 1040 Brussels, Belgium
Tel: + 32 2 550 08 11
Fax: + 32 2 550 08 19

EN European Standard
303-5 Heating Boilers-Part 5: Heating Boilers for Solid-Fuels, Manually and Automatically Stoked, Nominal Heat Output of Up to 500Kw – Terminology, Requirements, Testing and Marking (2022)

Amend Appendix AQ as follows (RE-21-33-24-R1):

AQ102.1 General.
The following words and terms shall, for the purposes of this appendix, have the meanings shown herein. Refer to Chapter 2 of this code for general definitions.
EGRESS ROOF ACCESS WINDOW. A skylight or roof window designed and installed to satisfy the emergency escape and rescue opening requirements of Section R310.2.
LANDING PLATFORM. A landing provided as the top step of a stairway accessing a loft.
LOFT. A floor level located more than 30 inches (762 mm) above the main floor, open to the main floor on one or more sides with a ceiling height of less than 6 feet 8 inches (2032 mm) and used as a living or sleeping space.
TINY HOUSE. A dwelling that is ~~400~~ 600 square feet (~~37~~ 56 m^2) or less in ~~floor area~~ *habitable space* excluding lofts.

End of *International Residential Code*® 2021 amendments

International Swimming Pool and Spa Code® 2021 amendments

Amend Section 101.1 as follows (SP-21-01-23):

101.1 Title. These regulations shall be known as the Swimming Pool and Spa Code of ~~[NAME OF JURISDICTION]~~the State of New Hampshire, hereinafter referred to as "this code."

Amend Section 102.7 as follows (SP-21-05-23):

102.7 Referenced codes and standards. The codes and standards referenced in this code shall be those that are listed in Chapter 11, as further regulated by 102.7.2 – 102.7.9, and such codes and standards shall be considered to be part of the requirements of this code to the prescribed extent of each such reference. Where differences occur between provisions of this code and the referenced standards, the provisions of this code shall be the minimum requirements.

[A]102.7.1 Application of the International Codes. Where the International Residential Code is referenced in this code, the provisions of the International Residential Code shall apply to related systems in detached one- and two-family dwellings and townhouses not more than three stories in height. Other related systems shall comply with the applicable International Code or referenced standard.

102.7.2 Building. Reference in this code to the International Building Code are deemed references to the New Hampshire Building Code, RSA 155-A:1,IV.

102.7.3 Gas. The International Fuel Gas Code is not adopted by RSA 155-A:1,IV. Fuel gas systems shall comply with the New Hampshire Fire Code, pursuant to RSA 153:1, as amended in Saf-FMO 300. Fuel gas provisions are enforced by the building code official and the fire code official.

102.7.4 Mechanical. The provisions of the *International Mechanical Code*, as amended, shall apply to the installation, *alterations*, *repairs* and replacement of mechanical systems, including equipment, appliances, fixtures, fittings and appurtenances, including ventilating, heating, cooling, air-conditioning and refrigeration systems, incinerators and other energy-related systems.

102.7.5 Plumbing. The provisions of the International Plumbing Code, as amended, shall apply to the installation, alteration, repair and replacement of plumbing systems, including equipment, appliances, fixtures, fittings and appurtenances, and where connected to a water or sewage system and all aspects of a medical gas system.

102.7.6 The International Fire Code is not adopted by RSA 155-A:1,IV. References in this code to the International Fire Code are deemed references to the New Hampshire Fire Code, pursuant to RSA 153:1 as amended in Saf-FMO 300. These provisions are enforced by the building code official and by the fire code official.

102.7.7 Energy. The provisions of the 2021 International Energy Conservation Code, as amended, shall apply to all matters governing the design and construction of buildings for energy efficiency, except that references to the 2006 International Energy Conservation Code are deemed references to the 2006 International Energy Conservation Code, as amended during the period this code was applicable in New Hampshire.

102.7.8 Residential Code. References to the International Residential Code in this code are deemed references to the references to the New Hampshire Building Code, RSA 155-A:1,IV.

102.7.9 NFPA 70. References to NFPA 70, National Electrical Code, in this code are deemed references to the New Hampshire Building Code, RSA 155-A:1,IV.

Amend Section 105.1 as follows (SP-21-02-23):

105.1 When required. Any owner, or owner's authorized agent who desires to construct, enlarge, alter, repair, move, or demolish a pool or spa or to erect, install, enlarge, alter, repair, remove, convert or replace any system, the installation of which is regulated by this code, or to cause any such work to be performed, shall first make application to the code official and obtain the required permit for the work.

105.1.1 NH Department of Environmental Services Approval. All swimming pools and spas, meeting the definition of public bathing space or public bathing facility per Env-Wq 1100 rules, shall secure NHDES approval in addition to local jurisdiction approval.

Amend Section 113.4 as follows (SP-21-03-23):

113.4 Violation penalties. Any person who shall violate a provision of this code or shall fail to comply with any of the requirements thereof or who shall erect, install, alter or repair a pool or spa in violation of the approved construction documents or directive of the code official, or of a permit or certificate issued under the provisions of this code, shall be ~~guilty of a [SPECIFY OFFENSE], punishable by a fine of not more than [AMOUNT] dollars or by imprisonment not exceeding [NUMBER OF DAYS], or both such fine and imprisonment~~subject to penalties as prescribed by law. Each day that a violation continues after due notice has been served shall be deemed a separate offense.

Amend Section 114.4 as follows (SP-21-04-23):

114.4 Failure to comply. Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be subject to ~~fines established by the authority having jurisdiction~~penalties as prescribed by law.

End of *International Swimming Pool and Spa Code*® 2021 amendments

Amend Section 210.5(C)(1) as follows (EL-20-01-21):

210.5 Identification for Branch Circuits
(C) Identification of Ungrounded Conductors Ungrounded conductors shall be identified in accordance with 210(C) (1) or (2), as applicable
(1) Branch Circuits Supplied from More Than One Nominal Voltage System. Where the premises wiring system has branch circuits supplied by more than one nominal voltage system, each ungrounded conductor of a branch circuit shall be identified by ~~phase or line and~~ system at all termination, connection, and splice points in compliance with 210(5)(C)(1)(a) or (b)
(a) *Means of Identification* The means of identification shall be permitted to be by separate color coding, marking tape, tagging, or other approved means.
(b) *Posting of Identification Means* The method utilized for conductors originating within each branch circuit panelboard or similar branch-circuit distribution equipment shall be documented in a manner that is readily available or shall be permanently posted at each branch-circuit panelboard or similar branch-circuit distribution equipment. The label shall be of sufficient durability to withstand the environment involved and shall not be handwritten

Amend Section 210.8(A) as follows (EL-20-02-21):

210.8(A) Dwelling Units. All 125-volt, single phase 15 and 20 ampere ~~through 250 volt~~ receptacles installed in the locations specified in 210.8(A)(1) through (A)(~~11~~10) ~~and supplied by single-phase branch circuits rated 150 volts or less to ground~~ shall have ground-fault circuit- interrupter protection for personnel.
(1) – (4) unchanged
(5) Unfinished basements
Exception unchanged
(6) – (10) unchanged
(11) ~~Indoor Damp and Wet Locations~~

Amend Section 210.8(B) as follows (EL-20-03-21):

210.8(B) Other Than Dwelling Units. All 125-volt ~~through 250 volt~~ receptacles supplied by single-phase branch circuits ~~rated 150 volts or less to ground~~, ~~50~~ 20 amperes or less, ~~and all receptacles supplied by three-phase branch circuits rated 150 volts or less to ground, 100 amperes or less,~~ installed in the locations specified in 210.8(B)(1) through (B)(12) shall have ground-fault circuit-interrupter protection or personnel.
(1) – (5) unchanged
(6) Indoor ~~damp and~~ wet locations
(7) – (12) unchanged

Delete Section 210.8(E) as follows (EL-20-04-21):

210.8 (E) Equipment Requiring Servicing. [Delete Section in its entirety] ~~GFCI protection shall be provided for the receptacles required by 210.63.~~

Delete Section 210.8(F) as follows (EL-20-05-21):

210.8(F) Outdoor Outlets. [Delete Section in its entirety] ~~All outdoor outlets for dwellings, other than those covered in 210.8(A)(3), Exception to (3), that are supplied by single-phase branch circuits rated 150 volts to ground or less, 50 amperes or less, shall have ground-fault circuit interrupter protection for personnel.~~

Amend Section 210.12 as follows (EL-20-06-21):

210.12 Arc-Fault Circuit- Interrupter Protection. Arc-fault circuit-interrupter protection shall be provided as required in 210.12(A), (B), (C) and (D) (C) The arc-fault circuit interrupter shall be installed in a readily accessible location.
Exception: Arc fault circuit interrupter protective devices required by 210.12(A), (B), and (C) shall be permitted to be removed and replaced with non-AFCI devices as permitted by RSA 155-A:3-c.
210.12(A) Dwelling Units. unchanged
210.12(B) Dormitory Units. All 120-volt, single-phase, 15- and 20-ampere branch circuits supplying outlets ~~and devices~~ installed in dormitory unit bedrooms, living rooms, hallways, closets, ~~bathrooms,~~ and similar rooms shall be protected by any of the means described in 210.12(A)(1) through (6).
~~**210.12(C) Guest Rooms, Guest Suites, and Patient Sleeping Rooms in Nursing Homes and Limited-Care Facilities.** All 120-volt, single-phase, 15- and 20-ampere branch circuits supplying outlets and devices installed in guest rooms and guest suites of hotels and motels and patient sleeping rooms in nursing homes and limited-care facilities shall be protected by any of the means described in 210.12(A)(1) through (6).~~
210.12~~(D)~~(C) Branch Circuit Extensions or Modifications — Dwelling Units, Dormitory Units, and Guest Rooms and Guest Suites. Where branch circuit wiring for any of the areas specified in 210.12(A), (B), or (C) is modified, replaced, or extended, the branch circuit shall be protected by one of the following:
(1) By any of the means described in 210.12(A)(1) through (A)(6)
(2) A listed outlet branch-circuit-type AFCI located at the first receptacle outlet of the existing branch circuit
Exception: AFCI protection shall not be required where the extension of the existing branch circuit conductors is not more than 1.8 m (6 ft) and does not include any additional outlets or devices, other than splicing devices. This measurement shall not include the conductors inside an enclosure, cabinet, or junction box.

Amend Section 210.52(C) as follows (EL-20-07-21):

210.52 Dwelling Unit Receptacle Outlets
(C) Countertops and Work Surfaces. In kitchens, pantries, breakfast rooms, dining rooms, and similar areas of dwelling units, receptacle outlets for countertop and work surfaces that are 300 mm (12 in.) or wider shall be installed in accordance with 210.52(C)(1), through (C)(~~3~~4) and shall not be considered as the receptacle outlets required by 210.52(A).
(1) For the purposes of this section, receptacles installed in accordance with 210.52(C)(1)(a) or (C)(1)(b) shall be considered as one receptacle outlet.
(a) ~~where using multi-outlet assemblies, e~~ Each 300 mm (12 in.) of a multi-outlet assembly containing two or more receptacles installed in individual or continuous lengths ~~shall be considered to be one receptacle outlet~~.
(b) Each two receptacles installed in the same device box.
(~~1~~2) **Wall Spaces.** Receptacle outlets shall be located so there is no point along the wall line is more than 600 mm (24 in.) measured horizontally from a receptacle outlet in that space.
Exception: Receptacle outlets shall not be required directly behind a range, counter-mounted cooking unit, or sink in the installation described in Figure 210.52(C)(1).
(~~2~~3) **Island and Peninsula Countertops and Work Surfaces:** Receptacle outlets shall be installed in accordance with 210.52(C)(~~2~~3)(a) and (C)(~~2~~3)(b).
(a) **Locations With Countertop or Work Surface Wall Spaces**.
(1) At least one receptacle outlet shall be installed where the location is also provided with countertop or work surfaces totaling more than 1.2 linear meters (4 linear feet).
(b) **Locations Without Countertop or Work Surface Wall Spaces.** Receptacle outlets shall be installed in accordance with (1) or (2). Receptacle outlets shall be permitted to be located as determined by the installer, designer, or building owner.
(~~a~~1) At least one receptacle outlet shall be provided for the first 0.84 m^2 ($9ft^2$), or fraction thereof, of the countertop or work surface. A receptacle outlet shall be provided for every additional 1.7 m^2 ($18\ ft^2$), or fraction thereof, the countertop or work surface.
(~~b~~2) At least one receptacle outlet shall be located within 600 mm (2 ft) of the outer end of a peninsular countertop or work surface. ~~Additional required receptacle outlets shall be permitted to be located as determined by the installer,~~

~~designer, or building owner. The location of the receptacle outlets shall be in accordance with 210.52(C)(3).~~ A peninsula countertop is measured from the connected perpendicular wall.
(~~3~~4) **Receptacle Outlet Location.** Receptacle outlets shall be located in one or more of the following:
(1) On or Above Countertop or Work Surfaces: On or above, but not more than 500 mm (20 in), above the countertop or work surfaces.
(2) In Countertop or Work Surfaces: Receptacle outlets assemblies listed for use in countertop or work surfaces shall be permitted in countertop or work surfaces.
(3) Below countertop or work surfaces: Not more than 300 mm (12 in) below the countertop or work surface. Receptacles installed below a countertop or work surface shall not be located where the countertop or work surface extends more than 150 mm (6 in.) beyond its support base.
Receptacle outlets rendered not readily accessible by appliances fastened in place, appliance garages, sinks, or rangetops as covered in 210.52(C)(1), Exception, or appliances occupying assigned space shall not be considered as these required outlets.
Informational Note No. 1: See 406.5(E) and 406.5(G) for installation of receptacles in countertops and 406.5(F) and 405.5(G) for installations of receptacles in work surfaces. See 380.10 for installations of multioutlet assemblies.
Informational Note No. 2: See Annex J and ANSI/ICC A117.1-2009, Standard on Accessible and Usable Buildings and Facilities.

Amend Section 210.63(B)(2) as follows (EL-20-08-21):

210.63(B)(2) Indoor Equipment Requiring Dedicated Equipment Spaces. ~~Where~~ For equipment, other than service equipment, ~~requires~~ requiring dedicated equipment space as specified in 110.26(E), the required receptacle outlet shall be located within the same room or area as the electrical equipment ~~and shall not be connected to the load side of the equipment's branch-circuit disconnecting means~~.

Delete Section 230.67 as follows (EL-20-09-21):

230.67 Surge Protection. [Delete Section in its entirety]
~~**(A) Surge-Protective Device.** All services supplying dwelling units shall be provided with a surge-protective device (SPD).~~
~~**(B) Location.** The SPD shall be an integral part of the service equipment or shall be located immediately adjacent thereto.~~
~~*Exception: The SPD shall not be required to be located in the service equipment as required in (B) if located at each next level distribution equipment downstream toward the load.*~~
~~**(C) Type.** The SPD shall be a Type 1 or Type 2 SPD.~~
~~**(D) Replacement.** Where service equipment is replaced, all of the requirements of this section shall apply.~~

Amend Section 230.71(B) as follows (EL-20-10-21):

230.71 Maximum Number of Disconnects.
(B) Two to Six Service Disconnecting Means.
Two to six service disconnects shall be permitted for each service permitted by 230.2 or for each set of service entrance conductors permitted by 230.40, Exception No. 1, 3, 4, or 5. The two to six service disconnecting means shall be permitted to consist of a combination of any of the following:
(1) Separate enclosures with a main service disconnecting means in each enclosure
(2) Panelboards with a main service disconnecting means in each panelboard enclosure
(3) Switchboard(s) where there is only one service disconnect in each separate vertical section where there are barriers separating each vertical section
(4) Service disconnects in switchgear or metering centers where each disconnect is located in a separate compartment
(5) Metering Centers with barriers as required in article 230.62(C)

Amend Section 250.140 as follows (EL-20-11-21):

250.140 Frames of Ranges and Clothes Dryers. Frames of electric ranges, wall-mounted ovens, counter-mounted cooking units, clothes dryers, and outlet or junction boxes that are part of the circuit for these appliances shall be connected to the equipment grounding conductor in the manner specified by 250.134 or 250.138.
Exception No.1: For existing branch-circuit installations only where an equipment grounding conductor is not present in the outlet or junction box, the frames of electric ranges, wall-mounted ovens, counter mounted cooking units, clothes dryers, and outlet or junction boxes that are part of the circuit for these appliances shall be permitted to be connected to the grounded circuit conductor if all the following conditions are met.
(1) The supply circuit is 120/240-volt, single-phase, 3-wire; or 208Y/120-volt derived from a 3-phase, 4-wire, wye-connected system.
(2) The grounded conductor is not smaller than 10 A WG copper or 8 A WG aluminum.
(3) The grounded conductor is insulated, or the grounded conductor is uninsulated and part of a Type SE service-entrance cable and the branch circuit originates at the service equipment.
(4) Grounding contacts of receptacles furnished as part of the equipment are bonded to the equipment.
Exception No. 2: For existing branch-circuit installations only where the equipment supplies a dwelling unit(s) and there is no equipment grounding conductor present in the outlet or junction box, the frames of the appliances specified in Exception No. 1 shall be permitted to be connected to the grounded conductor provided all the conditions specified in (1), (2) and (4) of Exception No. 1 are met, the grounded conductor of the circuit supplying the appliance(s} is part of a nonmetallic sheathed cable and it is insulated or covered within the supply enclosure so it does not make contact with any normally non-current-carrying metal parts.

Amend Section 314.27(C) as follows (EL-20-12-21):

314.27(C) Boxes at Ceiling-Suspended (Paddle) Fan Outlets.
Outlet boxes or outlet box systems used as the sole support of a ceiling-suspended (paddle) fan shall be listed, shall be marked by their manufacturer as suitable for this purpose, and shall not support ceiling-suspended (paddle) fans that weigh more than 32 kg (70 lb). For outlet boxes or outlet box systems designed to support ceiling-suspended (paddle) fans that weigh more than 16 kg (35 lb), the required marking shall include the maximum weight to be supported.
~~Outlet boxes mounted in the ceilings of habitable rooms of dwelling occupancies in a location acceptable for the installation of a ceiling-suspended (paddle) fan shall comply with one of the following:~~
~~(1) Listed for the sole support of ceiling-suspended (paddle) fans~~
~~(2) An outlet box complying with the applicable requirements of 314.27 and providing access to structural framing capable of supporting of a ceiling-suspended (paddle) fan bracket or equivalent.~~
Where spare, separately switched, ungrounded conductors are provided to a ceiling-mounted outlet box, in a location acceptable for a ceiling-suspended (paddle) fan in one-family, two-family, or multifamily dwellings, the outlet box or outlet box system shall be listed for sole support of a ceiling suspended (paddle) fan.

Amend Section 334.10 as follows (EL-20-13-21):

334.10 Uses Permitted. Type NM, Type NMC, and Type NMS cables shall be permitted to be used in the following, except as prohibited in 334.12:
(1) No change.
(2) Multi-family dwellings permitted to be of Types III, IV, and V construction.
(3) Other structures permitted to be of Types III, IV and V construction. Except as permitted by 334.10 (6), ~~C~~cables shall be concealed within walls, floors, or ceilings that provide a thermal barrier of material that has at least a 15-minute finish rating as identified in listings of fire-rated assemblies.
Exception to (2) and (3): For buildings or structures required to be of Type I or Type II construction, Type NM, Type NMC. and Type NMS cables shall be permitted to be used, provided that where so applied in buildings or structures exceeding three stories above grade, circuits run In Type NM. NMC or NMS cable shall not leave the floor or dwelling unit from which the circuits originate
(4) No change.
(5) No change.
(6) Exposed within:

a. dropped and suspended ceiling cavities.
b. accessible attics and roof spaces.
c. unfinished basements and crawl spaces.
Except as Permitted by 334.30 {B) (2) for connections to luminaires and equipment, cables shall be installed to closely follow the surface of framing members, running boards, or the equivalent.

Amend Section 334.12 as follows (EL-20-13-21):

334.12 Uses Not Permitted.
(A) Types NM, NMC, and NMS. Types NM, NMC, and NMS cables shall not be permitted as follows:
(1) In any dwelling or structure not specifically permitted in 334.10(1), (2), (3) and (5)
~~(2) Exposed within a dropped or suspended ceiling cavity in other than one- and two-family and multifamily dwellings.~~
(~~3~~2) As service-entrance cable.
(~~4~~3) In commercial garages having hazardous (classified) locations as defined in 511.3.
(~~5~~4) In theaters and similar locations, except where permitted in 518.4(8).
(~~6~~5) In motion picture studios.
(~~7~~6) In storage battery rooms.
(~~8~~7) In hoistways or on elevators or escalators.
(~~9~~8) Embedded In poured cement, concrete, or aggregate.
(~~10~~9) In hazardous (classified) locations, except where specifically permitted by other articles in this *Code*.

Amend Section 334.30 as follows (EL-20-13-21):

334.30(B)(2) is not more than 1.4 m (4 ½ ft.) from the last point of cable support to the point of connection to a luminarire or other piece of electrical equipment and the cable and point of connection are within an accessible ceiling ~~in one, two, or multifamily dwellings~~.

Amend Section 406.12 as follows (EL-20-14-21):

406.12 Tamper-Resistant Receptacles. All 15- and 20-ampere, 125- and 250-volt nonlocking-type receptacles in the areas specified in 406.12(1) through ~~(8)~~(6) shall be listed tamper-resistant receptacles.
(1) – (5) unchanged
~~(6) Subset of assembly occupancies described in 518.2 to include places of awaiting transportation, gymnasiums, skating rinks, and auditoriums~~
~~(7)~~(6) Dormitory units
~~(8) Assisted living facilities~~

Amend Section 422.5(A) as follows (EL-20-15-21):

422.5 Ground-Fault Circuit-Interrupter (GFCI) Protection for Personnel.
(A) General. Appliances identified in 422(A)(1) through (A)(7) rated 150 volts or less to ground and ~~60~~ 20 amperes or less, single ~~or 3~~ phase, shall be provided with Class A GFCI protection for personnel. Multiple Class A GFCI protective devices shall be permitted but shall not be required.

Amend Section 422.16(B)(2) as follows (EL-20-16-21):

422.16(B)(2) Built-in Dishwashers and Trash Compactors.
Built-in dishwashers and trash compactors shall be permitted to be cord-and-plug-connected with a flexible cord identified as suitable for the purpose in the installation instructions of the appliance manufacturer where all of the following conditions are met:

(1) For a trash compactor, the length of the cord shall be 0.9 m to 1.2 m (3 ft to 4 ft) measured from the face of the attachment plug to the plane of the rear of the appliance.
(2) For a built-in dishwasher, the length of the cord shall be 0.9 m to 2.0 m (3 ft to 6.5 ft) measured from the face of the attachment plug to the plane of the rear of the appliance.
(3) Receptacles shall be located to protect against physical damage to the flexible cord.
(4) The receptacle for a trash compactor shall be located in the space occupied by the appliance or adjacent thereto.
(5) The receptacle for a built-in dishwasher shall be located in the space adjacent to the space occupied by the dishwasher.
~~Where the flexible cord passes through an opening, it shall be protected against damage by a bushing, grommet, or other approved means.~~
(6) The receptacle shall be accessible.
(7) The flexible cord shall have an equipment grounding conductor and be terminated with a grounding-type attachment plug.
Exception: A listed appliance distinctly marked to identify it as protected by a system of double insulation shall not be required to be terminated with a grounding-type attachment plug

Amend Section 440.14 as follows (EL-20-17-21):

440.14 Location. Disconnecting means shall be located within sight from, and readily accessible from the air-conditioning or refrigerating equipment. The disconnecting means shall be permitted to be installed on or within the air-conditioning or refrigerating equipment.
The disconnecting means shall not be located on panels that are designed to allow access to the air-conditioning or refrigeration equipment or to obscure the equipment nameplate(s).
Exception No. 1: Where the disconnecting means provided in accordance with 430.102(A) is lockable in accordance with 110.25 and the refrigerating or air-conditioning equipment is essential to an industrial process in a facility with written safety procedures, and where the conditions of maintenance and supervision ensure that only qualified persons service the equipment, a disconnecting means within sight from the equipment shall not be required.
Exception No. 2: Where an attachment plug and receptacle serve as the disconnecting means in accordance with 440.13, their location shall be accessible but shall not be required to be readily accessible
Exception no. 3: The disconnect for an indoor unit of a ductless mini-split system shall not be required if the disconnect for the outdoor condensing unit that feeds the indoor unit is lockable in the open position in accordance with 110.25.

Amend Section 450.9 as follows (EL-20-18-21):

450.9 Ventilation. The ventilation shall dispose of the transformer full-load heat losses without creating a temperature rise that is in excess of the transformer rating.
Informational Note No. 1: See IEEE C57.12.00-2015, *General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers*, and IEEE C57.12.01-2015, *General Requirements for Dry-Type Distribution and Power Transformers*.
Informational Note No. 2: Additional losses occur in some transformers where nonsinusoidal currents are present, resulting in increased heat in the transformer above its rating. See IEEE C57.110-2008, *Recommended Practice for Establishing Liquid-Filled and Dry-Type Power and Distribution Transformer Capability When Supplying Nonsinusoidal Load Currents*, where transformers are utilized with nonlinear loads.
Transformers with ventilating openings shall be installed so that the ventilating openings are not blocked by walls or other obstructions. The required clearances shall be clearly marked on the transformer. ~~Transformer top surfaces that are horizontal and readily accessible shall be marked to prohibit storage.~~

Delete Section 680.4 as follows (EL-20-19-21):

680.4 Inspections After Installation. [Delete Section in its entirety]
~~The authority having jurisdiction shall be permitted to require periodic inspection and testing.~~

End of NFPA 70™ – *National Electrical Code*® 2020 amendments